Vol. VIII NOVEMBER, 1918 No. 11

AMERICAN JOURNAL OF PUBLIC HEALTH

THE JOURNAL OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

The 1890 Epidemic of Influenza in Chicago and Its Influence on Mortality, 1890 to 1893 Inclusive
W. A. Evans, M. D., and M. O. Heckard, M. D.

Preliminary Report of the 1918 Influenza Epidemic in Chicago
John Dill Robertson, M. D., and Gottfried Koehler, M. D.

Charts of the Influenza Epidemic in Large Cities
By the Editor

Fraternal Insurance Companies and the A. P. H. A.
Leo K. Frankel, Ph.D.

PUBLISHED MONTHLY AT
11 DEPOT STREET, CONCORD, N. H.
ADDRESS CORRESPONDENCE TO
EDITORIAL OFFICE, 126 MASSACHUSETTS AVE.
BOSTON, MASS.

Subscription Price, $4.00 per Year. Single Copies, 50 cents.
A. P. H. A. Membership, including Subscription, $5.00 per Year.

Entered as Second Class Matter at the Post Office at Concord, N. H.

AMERICAN PUBLIC HEALTH ASSOCIATION ANNUAL MEETING,
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Vol. VIII NOVEMBER, 1918 No. 11

FRATERNAL ORDERS AND THE AMERICAN PUBLIC HEALTH ASSOCIATION.

LEE K. FRANKEL, PH. D.,
Treasurer, American Public Health Association, New York City.

Address before the National Fraternal Congress at Philadelphia, August 26, 1918.

I HAVE been waiting for almost ten years for an opportunity to meet and to address representatives of the fraternal orders of the United States and Canada. Just about ten years ago, when I was connected with the Russell Sage Foundation, I began a study of fraternal insurance for that Foundation. It has always been a matter of regret to me that the study was never finished. Only recently, I had occasion to look over some of the data which were collected at that time from the questionnaires which you or your predecessors were kind enough to fill out for me; and I was amazed to find that the data had grown obsolete in ten years—that the strides made in this country in the intervening period had been so great that the publishing of the statistics now would be useless.

Your President has spoken accurately in saying that the thing that we must develop in the United States is not primarily insurance against known hazards of life, but rather to try to reduce those hazards. Should not the proposition of paying compensation or benefits for unnecessary sickness and preventable accidents be discontinued? To my mind, it is fundamental in any insurance scheme, to see whether the efforts of the organizations preaching the doctrine of insurance protection, cannot eliminate the necessity for the further extension of these organizations. I should like to see the time come when there will be no need for sickness insurance, when we shall have eradicated all preventable diseases, and the only sickness known, shall be the sickness of normal old age; and when we shall cut down our mortality to such an extent that insurance companies will pay claims only at ninety-nine years of age.

Now if you give that matter a thought, and there is a very serious side to it, it may interest you to know just what has been done in the control of mortality. I listened with interest to Doctor Clark, when he roused you to the point of a resolution by telling us of the awful things happening on the Western front to our Canadian brothers and to our own boys; and without thought of speaking in any but a respectful manner, I would say that I wonder whether we would have been aroused to such a pitch of hatred, of feeling that something must be done, if we had been told that equally as many persons in civilian life had died from disease. If we had been thus roused our

attitude would have been in marked contrast to the indifference toward sickness prevention all of us have displayed during the last few decades. It is no exaggeration to say that we have sat by almost apathetically, taking sickness as a visitation of God. I can take you to certain sections of the country where women still believe that children must go through certain children's diseases—that they must have whooping-cough, diphtheria, measles, etc., in order to become healthy adults. We have sat by, all these decades accepting these conditions as inevitable and have done practically nothing to improve them.

Now, have they been improved? May I tell you some of the facts? In 1880, the mortality in the registration area from all causes of death was 19.8 per thousand persons. That death-rate has been cut down. In 1916, it was just 14.0. The mortality from typhoid fever in the period from 1901 to 1905 was 32.0 per hundred thousand. In the year 1916, it had dropped to 13.3 per hundred thousand. Through the efforts of the fraternal orders? Through the efforts of the insurance companies? No. Malaria has gone down from 4.8 in the period 1901 to 1905 to 3.0 in 1916; smallpox, from 3.4 to 0.2. Smallpox is becoming a comparatively rare cause of death in the United States. The rate for diphtheria and croup fell from 29.6 to 14.5; and even the figure for tuberculosis of the lungs dropped from 170.7 to 119.4 per hundred thousand persons exposed.

I ask the question again, and I ask it frequently, who is responsible? If there is any fraternalist here who can honestly say that it is due to the efforts of the fraternal orders, I shall be glad to be enlightened. Speaking as an insurance man, I can say that it is not due to the efforts of insurance companies. In other words, we have sat contentedly by and allowed a big movement to go on, accepted the benefits and fruits of the movement, and have not raised a hand to help it. I wonder whether your current rates would be adequate if the mortality you expected twenty-five years ago were maintained today.

Who has done it? You have not. We know that the insurance companies have not. There is not an insurance company, to my knowledge, that has attempted to do more than formal things, and those only in very recent years, in this campaign for the prolongation of human life. It has been done by a few trained men; by men coming from Canada, the United States, Mexico and Cuba; sanitarians, health officers, bacteriologists, laboratory men and sanitary engineers who came together, originally fifty years ago, and formed themselves into an organization called the American Public Health Association. These men, to my mind, made one great mistake. They hid their light under a bushel. Their organization has been made up almost exclusively of technicians. Yet their deliberations, the reports of their committees, the work done by their members, stamped out yellow fever in Cuba and in the United States; has cut down the ratio of deaths from diphtheria, typhoid fever, tuberculosis, measles, whooping-cough and other preventable diseases from the high rates in 1870 and 1880 to what they are today.

This organization, gentlemen, is made up of a membership of approximately two thousand. It represents, as I stated, four countries. Its present President is a Canadian, Doctor Hastings, the health officer of Toronto. One of its other officers, Doctor Bryce, is also a Canadian. One Ex-President, Doctor Evans, is from Chicago. Practically all the men whose names you are reading in the papers today, who are coöperating with this

government in improving the sanitation of the army camps here and abroad, are listed among its members.

This organization comes to you now and asks you to realize that it is doing your work; that if you are paying relatively fewer death claims today than twenty-five years ago, the American Public Health Association is responsible in part for it; that if typhoid fever is gradually disappearing, it is due to the work of the engineering section of this association in establishing proper standards of filtration, proper standards of chlorination, proper means of carrying out advantageously steps such as were taken in Cincinnati where the typhoid fever death-rate declined from 79.2 in 1904 to 3.2 per 100,000 in 1916, and in Pittsburg, from 144.3 in 1900 to 9.0 in 1916. This organization comes to you in connection with your health conservation committee, and says, "Be a part of us." We have the trained men. We have in our organization practically every important health officer in the United States and Canada. We realize the opportunity for this organization in the coming years, particularly in view of the need of preserving the health, not only of the army, but of the civilian population that remains behind. The opportunity for this organization becomes greater and greater. We have everything but money. We need the sinews of war. We have an ambitious program laid out, which includes the education of the public health officers in the smaller communities, the attempt to secure in every city full-time health officers, the obtaining of adequate salaries for these officers, and the securing of sufficient appropriations for public health work in every community. We contemplate publishing a popular health magazine. We have a journal now, but it is technical; and we want to have one that shall correspond with the *National Geographic Magazine*. We contemplate encouraging the establishment of schools for the education of health officers, and we have already organized state health sections.

Here is our program. Here is your opportunity to come in. We have a corporate membership, under which any organization may join by paying fifty dollars and upwards annually. If the six million members (and probably there are more in the fraternal orders) were to contribute one cent a-piece, we could carry on a campaign through the medium of this organization, that, I am sure, would, in the next ten or fifteen years, markedly reduce mortality from preventable diseases and the diseases of middle life; and if that can be done, what does it mean for you in the last analysis? That you will be able to sell insurance cheaper than you can now; that your mortality table will unquestionably be adequate.

This matter was presented last February at the meeting of the Association of Life Insurance Presidents by Doctor Hastings; and at that time, a resolution was passed by that Association recommending that the individual companies in the Association become members of the American Public Health Association. It is very gratifying for me to be able to report today, that, as the result, we have obtained the membership of a number of insurance companies, who are paying from one thousand dollars to one hundred dollars per annum. A campaign is now being carried on among the smaller life insurance companies.

You should realize that the American Public Health Association is your organization, that it is represented in every town in this broad country; that the work it is doing in popularizing and developing the knowledge of public health is done for you and for your constituent

bodies; and that opportunity would be given in the association, and in the annual program of the association, to discuss health problems of fraternal organizations.

I am leaving this matter in your hands. I have no thought of dwelling on the seriousness of the outlook in this country regarding health conditions with the present shortage of nurses and physicians. It is already apparent that the conditions are worse than they were a year ago. The available mortality records of American cities last year showed, for the first time in years, an almost stationary death-rate from tuberculosis (in some cases an actual increase), after all the splendid campaigns that had been waged against the disease. Apparently the fact that men and women are working under more strenuous conditions, or when they should not work at all, has checked the downward trend of the death-rate for this disease. Unless the campaign carried on by the Federal Children's Bureau is consummated, there is likelihood that there will be an increase in the death-rate among children. It is probable that there will be an increase in the death-rates of other diseases. This is of interest to you as the guardians of the fortunes of millions of men and women, who repose their trust in you. I feel quite confident that I may leave this matter of active participation in the work of the American Public Health Association in your hands, with the assurance that you will give it fair and just consideration.

◈

A Program for Maternity Care.—The work that is being attempted in one small district in New York is an experiment only in that it is an effort to cover completely the need for maternity care, prenatal, delivery and postnatal, in a given community, by providing for every woman in that community medical supervision and nursing care from the beginning of her pregnancy until her baby is one month old. This is being attempted, not by establishing another medical and nursing agency, but by establishing a center through which the maternity work of every hospital, private physician, midwife and nursing agency in the community may be coördinated and developed to its fullest extent; a center at which there will be a complete record of every pregnancy in that district; a center from which the whole community may be educated to realize the need of and to demand adequate medical supervision and nursing care for every woman and her baby before and after birth.

The prenatal nursing is done by a combination of visits to the patients in their homes by the nurses of these agencies, and by the patients' visits to the nurse at the Maternity Center. This plan was adopted first for the sake of enabling fewer nurses to care for more patients, by having the patient do the traveling. It is of advantage to the patient in many ways to come to the Center, because they can be shown a model of the baby's bed, a model mother's bed at the time of delivery, material for making baby clothes, bought at wholesale, and sold to the mothers at the same price, patterns for making these baby clothes and people to help the women cut out the material and put it together. Every week a mothers' meeting is held where the women come and knit, one hour for the Red Cross and another hour on something for their own babies.—Stevens, Anne, *The Public Health Nurse*, September, 1918, p. 95. (*D. G.*)

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Annual Meeting, A. P. H. A., Chicago, Ill., December 9-12, 1918
Come, and Bring a New Member

FASHIONS AS AFFECTING PUBLIC HEALTH.

JEANNETTE THROCKMORTON, PH. B., A. M., M. D.

To be read before the Public Health Administration Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

THERE are fashions not only in dress, but in trend of thought and morals. Our primitive ancestors, living in warm climates, needed and wore no clothes, and it was really vanity which brought dress into being. For dress, before it was a protection or covering, was a decoration. It was the visible mark which set a man above his fellows. The primitive champion coming back from a hard fight with blood upon him, found himself admired by the women of his tribe, and envied by the men. Finding that this mark of battle gave him distinction, the conqueror let the blood remain on him as long as it would, and when the dried blood wore away, the scar remained as a mark of distinction. To this day, certain savages strive for conspicuous scars. And not only recognized savages, so also German students with their dueling scars. This doubtless is a reversion to atavistic tastes. Primitive man then set about to improve Nature and supplement accident. Red pigment closely resembling blood in color, was daubed on faces and bodies; the daubings became in time symmetrical and in regular patterns. The male for ages was the "dressy sex," and primitive woman leaned toward the man who displayed the most ornaments, such as bright stones, teeth of big game and scalp locks of his victims. So it is evident that dress was first adopted for vanity; then found necessary for protection as man pushed north and south in the conquest of the world; and lastly, as civilization crept forward, dress became a symbol of modesty.

Of these three impulses toward dress, that of protection seems most often disregarded by the gentler sex. Man being blessed with brains was expected by Nature to dress according to the climate in which he lived; hence she did not provide him with an extra coat of fur during the winter, as she does the lower animals. But we do not live up to her expectations! The majority of young girls who come into my office in winter, are half-clad, from choice rather than necessity. This condition prevails also among college girls in my state, as I personally know, and I presume feminine nature is no different in your respective states. I deplore this custom of the past few years of keeping our houses at summer heat and wearing no underwear in winter. The change from summer heat to zero weather is too extreme, and on stepping outdoors the body is at once chilled. The continual chilling of the skin causes congestion of the internal organs with many attendant ills. When I see young girls on the streets with their necks bare to winter winds, I find myself computing how many of them by such exposure are making themselves liable to future tuberculosis. The apices of the lungs, being constantly chilled and congested, offer a pleasant habitat for tubercle bacilli, who, never slow in accepting any harbor offered them, quickly invade this favorable territory. The streptococcus viridans has also encouragement to enter the human system, when continual "colds" cause abnormal condition of tonsils and pharyngeal and nasal membranes; and the resulting "rheumatism" teaches its possessor the lesson that lowering body temperature subnormally lessens natural resistance to germs. So also, the pelvic congestion incident to

insufficient clothing about hips and limbs, is an important factor in dysmenorrhea, amenorrhea and the simple anaemia so often seen in our adolescent girls.

Aside from the health standpoint, we want to be patriotic. The coal problem is an important one. "The present shortage of coal will actually improve our health," says Professor Huntington of Yale University, who investigated some sixty millions of deaths and arrived at the conclusion that "an average temperature of 64° is best for physical activity, while for mental activity a temperature not above 50° is most favorable." He states that the death-rate is higher in winter; not because of the cold air outside, but because of wrong air conditions inside the house, namely: too high a temperature and air too dry. The hot air of our furnace heated houses dries up the mucus membranes so we are more susceptible to colds and respiratory diseases. He advises the American people to put on more clothes and use less coal, and keep the air in their houses cooler and more moist.

To continue with the feminine garb. The erect posture assumed by man, makes extra demands on the ligaments supporting the abdominal organs. If the abdominal walls have a normal amount of adipose tissue, and the abdominal muscles and visceral ligaments have their natural tonicity, no additional support to the visceral organs is necessary. But few have this ideal condition, and since some form of corset will be worn by the majority of women, it should at least prevent rather than cause or exaggerate ptosis. Some authorities consider Splanchnoptosis as essentially a costume deformity; and it is true that the corset worn by the majority of women tends to produce that ideal of feminine beauty of the age of hoop-skirts and the Civil War period. But gradually there is coming into use the corset known as the 'straight front,' which gives the desired upward and backward pressure on all the viscera and which fits snugly at the hips and loosely at its upper extremity. This type of corset is built on scientific lines and is of much benefit in movable kidney and visceral ptosis and has been well described by Reynolds and Lovett.

Looking at the support of the abdominal viscera from another point of view, we see the cervical fascia, attached to the base of the skull, continued downward as the pericardium, giving support to the dome of the diaphragm. From the diaphragm is suspended the stomach by means of the liver and the lesser omentum. Goldthwait lays considerable stress on the importance of the cervical fascia, which "through its continuation (the pericardium) forms a suspensory ligament from the diaphragm." He has demonstrated that putting the cervical fascia on the stretch, by throwing the head backward, will raise the stomach three to four inches. In the round-shouldered individual there is a lack of tension on the cervical fascia, a dropping of the dome of the diaphragm, and therefore a prolapse of the stomach and transverse colon, aided of course by the relaxed abdominal muscles. Hence we see the necessity for a soldierly carriage and erect chest, and the need to discourage the droopy walk that our girls have imitated from the fashion sheets for the past few years. One good thing which will result from this war, I hope will be the fashion to walk erectly and properly.

But we cannot have proper carriage or gait, unless we have a suitable shoe. The majority of shoes worn by young women are improper in shape and cause faulty posture. They are too narrow and too pointed, and the high heel set with its bearing surface underneath the arch of the foot, is pernicious. The foot nat-

urally is supported on the heel and the heads of the first and fifth metatarsal bones. Normally the great toe is slightly adducted in walking, and there should be a space between it and the second toe about equal to the width of one of the small toes, as we see in infants. The fashionable shoe causes "hallux valgus" according to Dr. Tubby, as it crowds the great toe outward causing the second toe to over or under-ride its fellows, and exposing the metatarsal-phalyngeal articulation to pressure and the formation of bunion. The high heel causes the foot to slide forward, preventing all motion of the toes so essential to the preservation of the arch. Thus flat foot results, by the shifting of the body from the center of the astragalus to the inner side of the foot, and turning the foot outward and weakening the plantar structures. Metatarsalgia results from pinching the plantar nerve between the heads of the metatarsal bones, and is caused by a shoe too narrow. We encounter difficulty when an attempt is made to change suddenly into a shoe which gives proper freedom in walking, and has a wide flat sole, straight inner side and low broad heel. The tendo Achillis is found shortened by the continual elevation of the heel (incipient pes equinus), the great toe is extended upward; therefore a change back to a proper shoe has to be made gradually and the heel gradually lowered, and the patient reëducated in walking. Every shoe store is ready with various appliances to correct the very defects which the modern shoe causes. If we could only change the fashion in shoes, we would do away with these appliances and markedly increase the efficiency of the vast army of young women now engaged in public service.

In connection with dress and intimately associated with it, comes that subject now demanding so much attention in magazines and mothers' clubs, Social Hygiene. Morals and dress are intimately associated and never before has modesty in dress seemed so little in demand among our young girls. The customary street dress of last summer was an offense to one's finer sensibilities: with its abbreviated skirt, shoes designed to attract the eye—hose likewise—the thinnest of crepe waists with only a little ribbon and lace underneath, and cut so low in the neck as to be indecent. Who is at fault when our young girls wear such clothes? I believe it is the women—the good women—of our country who are to blame, because they do not frown upon such vulgar costumes and refuse to let their young daughters wear them. The adolescent daughters, having instincts and impulses which they do not understand, often use poor judgment not only in clothes but in conduct, and they need wise guidance and sympathetic help. The mating instinct is strong during adolescence and we must recognize this fact with sympathy. The period of adolescence is a trying one under any circumstances, and is especially so during these war conditions. We must teach our girls that they have a responsibility toward young men. We must teach them that it is true patriotism to train and control their emotions and impulses; and impress upon them that a great factor in accomplishing this end is to dress so as not to attract or arouse the sex passion; instead, by womanly qualities, to appeal to the better side of a man's life, wherein he respects and reveres the name of woman. We must teach our sons that they too have a responsibility toward womankind, and that any foolish unsophisticated girls who fall their way, are not their legitimate prey. We must teach them, that at this time when the whole nation is striving for efficiency in every activity, when every resource of

the country is called into service, that true patriotism demands that they should observe social morality and self-control; so that, unhampered by disease, they may give to their country their best and finest efforts and splendidly uphold America's promise of Liberty: "That every nation, God willing, shall have a new birth of Freedom, and that the Government of the people, by the people and for the people shall not perish from the Earth."

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A CRITICAL STUDY OF THE BACTERIAL COUNT IN WATER AND SEWAGE.

MILTON F. STEIN,
Designing Engineer, Division of Sanitary Engineering, Cleveland, Ohio.

To be read before the Laboratory Section, American Public Health Association, December 9-12, 1918, at Chicago, Ill.

THE bacterial count is one of the most generally used measures for the sanitary phases of water supply and sewage disposal questions. By means of it we gauge the pollution of a water, the strength of a sewage, the efficiency of a process of purification or disinfection, and the purity of the effluent. Doubtless we are assisted in our judgment by other indications, as, for instance, the coli test in the case of water supplies.*

All the details of the bacterial count have been subjected to considerable study and the whole procedure has been standardized, wherefore it rightly enjoys a great degree of confidence, but because of this confidence its use is often extended far beyond its scope unquestioningly, and the results obtained are taken at face value by many competent sanitary engineers.

If we inquire into the interpretation which we ordinarily almost subconsciously place upon this test, we find this to be that it represents *all the individual bacteria* in a cubic centimeter of the liquor examined. The fact that this is not true, when known, is generally reconciled by the vague conception that the number indicated is directly proportional to the total number present.

The causes which operate to make the observed results differ from the true or desired results may be grouped as follows:

1. Those arising from mathematical considerations based on the laws of chance.

2. Those due to errors or imperfections in the manipulation and technique of the test.

3. Those due to clotting of bacteria, or their adhesion to or occlusion in solid particles, causing a number of bacteria to produce but one colony.

4. Those due to failure of bacteria to grow because of unsuitable conditions.

5. Those due to accidents, such as death of bacteria, juxtaposition causing several to appear as one colony, etc.

It will be noted that causes 3, 4 and 5 all tend to reduce the bacterial count. Cause 2, while present with the best technique, may assume very large pro-

* An article on the mathematical interpretation of the coli test by the same author appeared in the *Engineering News*, May 24, 1917.

portions in incompetent hands, and unfortunately it is usually impossible to verify the details of testing *a posteriori* so that results must be taken at their face value.

MATHEMATICS OF THE BACTERIAL COUNT.

In considering the mathematical aspects of the bacterial count, it is well to impose certain restricting conditions:

1. It will be assumed that we are dealing with a single fair sample, eliminating all consideration of periodical and secular variations.

2. It will be assumed that the sample is well mixed and that all bacteria are free to move about, so that a reasonably uniform distribution of the bacteria throughout the sample is obtained.

3. That the plate count shows all the bacteria plated and intermediate errors are eliminated.

We may consider the sample to be composed of a large number of minute droplets, each the size of a bacterium, and interspersed with these the bacteria themselves.

If we consider that a one cubic centimeter sample pipetted off for plating contains s such particles, of which α are bacteria and β are droplets of water, then:

The probability that any such particle is a bacterium

$$= p = \frac{\alpha}{s} \qquad \text{I}$$

the probability that any such particle is a water droplet

$$= q = \frac{\beta}{s} = 1 - p \qquad \text{II}$$

Now, it can be shown that the most probable or expected number of bacteria in a sample of n c.c.'s or ns particles is:

$$\epsilon(n\alpha) = nsp, \text{ or } \epsilon(\alpha) = sp \qquad \text{III}$$

and further, that the *mean error* of this expected value

$$\epsilon(n\alpha) = \sqrt{nspq}, \text{ or } \epsilon(\alpha) = \sqrt{\frac{spq}{n}} \qquad \text{IV}$$

The proof for these formulæ can be found in the more recent text-books on probabilities.

So far we have been theoretically correct in that we divided our sample into particles of the same size as bacteria. We might have used much larger droplets, distinguishing between those containing a bacterium and those not containing one. For the expression $\epsilon(\alpha)$ may be written

$$\epsilon(\alpha) = \sqrt{s \cdot \frac{\alpha}{ns} \cdot q}$$

wherein the s's cancel and q approaches unity as the size of particles decreases, for all reasonable number of bacteria (up to many million per cubic centimeter). So we may say, without appreciable error, that

$$\epsilon(\alpha) = \sqrt{\frac{\alpha}{n}} \qquad \text{V}$$

This holds practically even when several dilutions are made. For supposing a plating after double dilution to .0001 yields 100 colonies. This means an error of

$$\sqrt{100} \text{ or } 10 \text{ per cent.}$$

The error of sampling the first dilution would be

$$\sqrt{100 \times 100} \text{ or } 100,$$

equivalent to 1 per cent and of sampling the original,

$$\sqrt{100 \times 100 \times 100} = 1000$$

or 0.1 per cent. This would give a total mean error of sampling, including that due to dilutions of

$$\pm\sqrt{101} = \pm 10.05 \quad \text{or} \quad \pm\sqrt{99} = \pm 9.95$$

In considering a series of determinations, the same reasoning applies. If N samples of n cubic centimeters each are taken, the most probable or expected number of bacteria per cubic centimeter is

$\epsilon(Nna) = Nnsp$, or $\epsilon(a) = sp$ as before.

Similarly the expected error in the average of N determinations is

$$\epsilon(a_M) = \sqrt{\frac{a}{Nn}} \qquad \text{VI}$$

From these formulæ the following rules may be formulated:

The expected error in bacteria per cubic centimeter based on a single sample is equal to the square root of the quotient obtained in dividing the number of bacteria per cubic centimeter by the size of the sample taken in cubic centimeters.

The expected error of the mean of N samples is obtained by dividing the expected error for a single sample by the square root of N.

The mean value of N determinations is equal to the expected value for a single sample.

We are interested in knowing the probability that the bacterial count on any plate will not deviate from the true value by more than a certain number of times the mean error. The criterion of Tchebycheff tells us that the probability P_T of a deviation of a variable from its expected value, not larger than λ times its mean error, is greater than $\left(1-\frac{1}{\lambda^2}\right)$.

$\lambda = 3,\ P_T > 1-\frac{1}{9} = 0.888$

$\lambda = 4,\ P_T > 1-\frac{1}{16} = 0.937$

$\lambda = 5,\ P_T > 1-\frac{1}{25} = 0.960$

We are now in a position to plot the mathematical error of plating a sample of water or sewage, as well as the errors which may be expected once in five, ten times, etc. This has been done in Figure 1. These values are subject to the restrictions enumerated at the beginning of this section.

Two conclusions can be drawn from this mathematical study and by inspection of Figure 1:

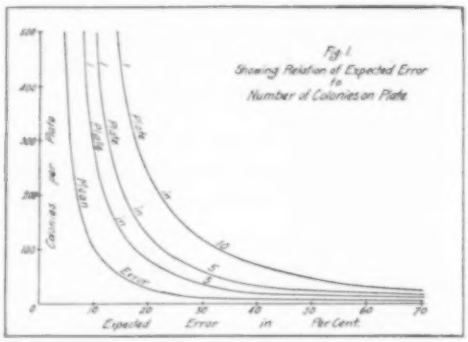


Fig. 1
Showing Relation of Expected Error to Number of Colonies on Plate
Colonies per Plate Mean
Expected Error in Per Cent.

1. The size of sample or the dilution should be such as to give from 200 to 400 colonies on the plate. With larger numbers the error decreases but slowly (and the greater accuracy is more than offset by interferences, etc.); while with smaller numbers the error increases rapidly.

2. There is considerable probability that, if only one plate is used, the count will depart largely from the true value. Hence the importance of making several plates (3 to 10) from the same sample, particularly in the case of disinfection and similar studies.

Mathematical Interpretation of Results.

In actual work we do not know *a priori* the number of bacteria in the liquor under investigation, but attempt to deduce this from the tests. The vagaries of a single test have been shown in the preceding section. In laboratory tests, where we are following the same sample of sewage through various processes, a series of platings should be made at each desired step in the process. In plant control or large scale studies, it is obvious that the average of say thirty daily

tests would depart much more from the true mean than would the average of thirty tests on the same sample. Let us restrict ourselves for the present to the laboratory condition.

Suppose we have made N platings of a sample. It can be proven that the *arithmetic mean* is equal (theoretically) to the expected number of bacteria, $\epsilon(a) = sp$ (Equation III).

Another important function is the dispersion. This may be indicated by δ and defined by the equation

VII

$$\delta^2 = \frac{(a_1 - M)^2 + (a_2 - M)^2 + \ldots (a_N - M)^2}{N}$$

where a_1, a_2, a_3 . . . a_N are the number of bacteria obtained on the various plates, and M is the mean value. Now, it can be shown that δ is equal to ϵ or the mean error in a single trial. Thus we are able to approximate the number of bacteria in a sample from the average of a number of platings and the deviation of same.

A Study of Some Actual Results.

Below are given a few actual results to illustrate the methods of computation and the actual variations in results from the same sample of sewage due to errors of sampling, manipulation, etc.

Table I gives the results of a series of tests made by an experienced man with special care as to all details. This shows a standard deviation (dispersion) of 11 per cent or over twice the theoretical error due to sampling. Had only one test been made, and had this by chance been No. 14, the result would have been 25 per cent too high, whereas had the chance fallen on No. 4, the result would have been only 20 per cent of the correct value, and no one the wiser.

Table II gives the results of a series of tests made during routine work and shows a standard deviation of 26 per cent and maximum variations of over 40 per cent.

Table III is added as tending to show that the number of dilutions does not affect accuracy of results greatly.

From a considerable number of such series of tests we may roughly formulate the following as the variations to be expected, not regarding occasional "flukes."

1. For careful and accurate work (200 colonies per plate):

a. Standard Deviation	$\pm 12\%$
b. Deviation (1 in 10 times)	$\pm 25\%$

2. For ordinary routine work (200 colonies per plate):

a. Standard Deviation	$\pm 25\%$
b. Deviation (1 in 10 times)	$\pm 50\%$

Now, as to tests made in the routine of plant operation and control. Obviously, in addition to the errors due to sampling and plating, as in a single sample, we here have variations in the samples themselves, which make it much more difficult to interpret results rationally.

In water supplies the variation may be periodic from season to season, as in lakes and large reservoirs, or this periodic fluctuation may have superimposed upon it very erratic changes, as those due to floods, etc., in river supplies.

In the case of sewage there are several superimposed periodic variations: a daily, a weekly and a seasonal period, and in addition a secular fluctuation due to gradually changing conditions.

The condition in which the proportion of positive to total results (that is, the probability) varies from test to test has been studied mathematically, and the series of errors thus derived is known as the Lexian or hypernormal series. It can be shown that the mean in such a series is the same, as in the usual (Bernoullian) series already discussed, but

TABLE I.

RAW SEWAGE, WEST 58TH STREET OUTFALL, JULY 2, 1918.

Incubation, 24 hrs. at 37° C. Dilution, 1/100×1/100. Controls, 0-0-0. Special Care Used.

	Count.	Deviation.	Deviation.²
1	3,780,000	204,000	41,600,000,000
2	4,340,000	356,000	126,600,000,000
3	3,800,000	184,000	33,900,000,000
4	840,000 (omitted)		
5	4,280,000	296,000	87,600,000,000
6	3,340,000	644,000	414,000,000,000
7	3,980,000	4,000	16,000,000,000
8	3,300,000	684,000	466,000,000,000
9	4,370,000	386,000	149,000,000,000
10	4,160,000	176,000	31,000,000,000
11	4,060,000	76,000	5,760,000,000
12	3,730,000	254,000	64,500,000,000
13	3,650,000	334,000	111,200,000,000
14	5,000,000	1,016,000	1,030,000,000,000
15	Overgrowths		
			2,577,160,000,000
Av.	3,984,000		
Med.	3 980,000		

Standard Deviation $\sqrt{\frac{2,577,160,000,000}{1\ 3}} = \pm\ 445,000 = \pm 11.2\%$

Maximum Deviation $= +1,016,000 = +25.5\%$

$= -\ 684,000 = -17,1\%$

Computed Mean Error $\sqrt{\frac{3,984,000}{1/10000}} = \pm\ 200,000 = \pm\ 5.0\%$

Lexian Ratio = 2.2

Coefficient of Disturbancy = 10.0

TABLE II.

RAW SEWAGE, WEST 58TH STREET OUTFALL, MAY 31, 1918.

Incubation, 24 hrs. at 37° C. Dilution, 1/100×1/100. Controls 0-0-0. Routine Analysis.

	Count.	Deviation.	Deviation.²
2a	1,800,000	20,000	400,000,000
b	2,410,000	630,000	396,900,000,000
3a	1,320,000	460,000	211,600,000,000
b	1,130,000	650,000	422,500,000,000
4a	1,050,000	730,000	532,900,000,000
b	2,040,000	260,000	67,600,000,000
5a	1,810,000	30,000	900,000,000
b	2,020,000	240,000	57,600,000,000
6	2,500,000	720,000	518,400,000,000
7	1,720,000	60,000	3,600,000,000
			2,212,400,000,000
Av.	1,780,000		
Med.	1,805,000		

Standard Deviation $\sqrt{\frac{2,212,400,000,000}{1\ 0}} = +470,000 = \pm 26.4\%$

Maximum Deviation $= +720,000 = +40.0\%$

$= -730,000 = -41.0\%$

Computed Mean Error $\sqrt{\frac{1,780,000}{1/10000}} = \pm 133,000 = \pm\ 7.5\%$

Lexian Ratio = 4.2

Coefficient of Disturbancy = 30.7

TABLE III.

RAW SEWAGE DILUTED TO 1/100, WEST 58th STREET OUTFALL, JUNE 5, 1918.

Incubation, 24 hrs. at 37° C. Dilution, 1/100. Controls, 0-0-0.

	Count.	Deviation.	Deviation.²
1	24,000	18,560	344,100,000
2	36,500	6,060	36,700,000
3	40,800	1,760	3,100,000
4	42,200	360	129,600
5	26,100	16,460	271,000,000
6	30,000	12,560	158,000,000
7	62,000	19,440	378,000,000
8	43,500	940	884,000
9	58,500	5,940	35,200,000
10	62,000	19,440	378,000,000
Av.	42,560		1,605,113,600
Med.	41,500		

Standard Deviation $\sqrt{\frac{1,605,113,600}{1\ 0}} = \pm 12,670 = \pm 29.8\%$

Maximum Deviation $= +19,440 = +45.7\%$

$= -18,560 = -43.5\%$

Computed Error $\sqrt{\frac{42,560}{1/100}} = \pm\ 2060 = \pm\ 4.8\%$

Lexian Ratio $= 6.15$

Coefficient of Disturbancy $= 29.3$

the dispersion is greater. There can be many such series, depending upon how the probability varies from test to test. An extreme and very interesting case is that in which the probability varies from zero to one (*i.e.*, certainty) during the series of tests. Such a series can be readily studied both mathematically and experimentally by the black and white ball scheme, and may be regarded as a sort of standard for inconsistent results. (See No. 15, Hypernormal Mathematical Series (Lexis) in Table VI.)

Most statistical series are in the Lexian group so that the dispersion obtained is that of a Lexian series rather than of a normal or Bernoullian series. We have two criteria by which to judge the departure of the series from normal conditions:

a. *The Lexian Ratio:* which is the ratio of the dispersion computed from the actual tests to the theoretical mean error ϵ or δ_B (for a series of tests):

$$L = \frac{\delta}{\delta_B} \qquad \text{VIII}$$

b. *The Charlier Coefficient of Disturbancy:* which has the advantage of eliminating the effect of the number and size of samples:

$$100p = \frac{\sqrt{\delta^2 - \delta_B{}^2}}{M} \times 100 \qquad \text{IX}$$

In Table VI the Lexian Ratio and Coefficient of Disturbancy are given for a number of statistical series and error series for bacterial tests. Values for a subnormal, normal and hypernormal mathematical series are inserted to act as guide posts. It will be noted that the monthly data, based on one test a day, group around the Hypernormal Series, which we have characterized as a standard of inconsistency.

This state of affairs imposes upon the sanitary engineer, in addition to the precautions for the single test, the necessity of studying these various fluctuations, before any reliable judgment can be passed upon the bacterial content of the water or sewage in question.

In addition, it must be remembered that even when the sampling schedule covers the full scope of these variations, the deviations will be many times greater than in the same number of tests made on a liquor of constant composition.

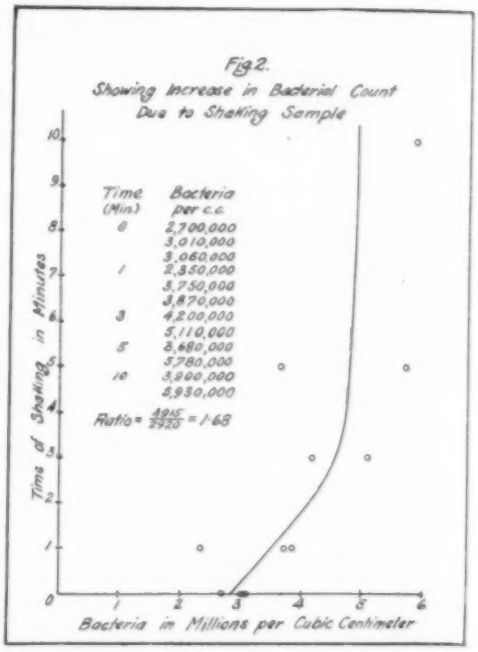
It is not intended to create the impression that an extremely elaborate series of tests should usually be made, but rather that the usual tests should be supplemented sufficiently by careful study of conditions to enable a fair judgment of their true significance to be rendered, and it should be realized that monthly averages as usually made are very far from being representative.

Relation of Usual Count to Total Bacteria.

The bacterial count does not represent the total number of bacteria present, even if all errors of sampling and manipulation are eliminated.

Examination of samples of sewage under the high power microscope will reveal many particles to which numerous bacteria are clinging, and there is good evidence that many more are occluded within the particles. The writer has attempted to separate or release such bacteria previous to plating by vigorously shaking the sample for ten minutes in a sterile bottle containing coarse sterilized sand. A record of a number of such tests is shown in Table IV, which shows an increase of 67 per cent over the usual method. In Figure 2 are given the results of an experiment on the effect of various periods of shaking.

But, even so, there is no record of the types which do not find the media and conditions favorable to development—such as anærobes. In investigating this question the writer made use of a method, the application of which to sewage work he believes to be novel, *i.e.*, the direct



count. The sample, after vigorous shaking with sand as above outlined, is stained with methylene blue. A drop is then placed on a blood-counting cell and counted under the high power microscope. (This method shows some promise as a means for rapidly determining the bacteria in sewage, aside from its usefulness in this case.) In one instance, where the average of ten tests by the usual method gave 3,950,000 per cc., the direct count gave 70,720,000 as the average of ten counts made by two observers. This latter figure included dead cells and probably some minute organic particles which might have been mistaken for bacteria, but the difference seems too great to explain away on any such grounds. Since making the above tests the writer's attention has been called to the fact that recently work along similar lines has been done on soil analysis, giving about twenty times as many bacteria by direct count as by the plating method.

Applying the Standard Method to Special Conditions.

In applying the standard count to unusual conditions considerable caution should be used if it is desired to avoid erroneous interpretation of results. As an example, the usual method of interpreting disinfection tests suggests itself. A raw sample and a disinfected sample are plated and incubated at 37° C. for 24 hours. The raw count is 2,000,000, the disinfected count, 20,000. The plates are returned to the incubator and counted again at the end of 48 and 72 hours. The raw will remain approximately constant, but the disinfected sample may give counts of 60,000 and 100,000 respectively. Apparently some of the bacteria were merely stunned or weakened by the disinfectant and only recovered sufficiently to develop as visible colonies one or two days later. Table V gives some actual results of this kind. This is quite apart from the question of "after-growths" which are due to multiplication of the bacteria, which have not been destroyed, in the water itself. Other cases where the literal use of standard methods will not yield the desired results will suggest themselves to the reader.

Conclusions.

It has been shown, that for platings of a uniform sample:

a. The expected error in a series of bacterial counts is given by the formula:

$$\epsilon(a_M) = \sqrt{\frac{a}{Nn}}$$

b. That consistent with convenience, from 200 to 400 colonies per plate give the greatest accuracy.

c. That for ordinary work three, and for accurate work, five or ten platings should be made of each sample, a single plating being unreliable.

d. A study of Table VI shows that with sufficient care the error in determining the bacteria in a single sample can be made to approach the normal error of sampling, putting such determinations in a class with other reliable statistical data.

Further study of Table VI shows that the results of a series of bacterial samples taken from day to day are extremely inconsistent. The criteria show this inconsistency to be due both to errors in the single sample, which can be eliminated to a large extent, and to the fact that the samples were not properly apportioned to the variations in the water or sewage, which source of error can be reduced by study of these variations. In these days of standards for filterable water, drinking water, etc., would it not be well to inquire into the nature of the rule which we are using for our measurements, both to determine its actual length and establish its accuracy?

It has further been shown that usual methods do not give the total number of bacteria present, due to clotting and unsuitable conditions for their growth. Rather perfunctory tests indicate that the number developed by plating is not over 10 per cent of those present, but a review of governing conditions will convince that no constant proportion can exist.

It has also been shown that under unusual conditions the standard method gives distorted results, and that for special work modifications to reduce these distortions seem advisable.

TABLE IV.

Relation of the Bacterial Counts by the Usual Methods and After Shaking Samples for Ten Minutes.

Test.	Usual Method.	After Shaking Ten Minutes.
25a	2,170,000	2,640,000
b		3,970,000
c	1,360,000	2,700,000
26a	1,980,000	3,200,000
b	2,180,000	3,050,000
c	4,370,000	1,130,000
27a	2,980,000	2,770,000
b	2,060,000	3,640,000
c	1,450,000	3,310,000
28a	2,110,000	4,820,000
b	1,890,000	5,200,000
c	1,330,000	5,700,000
29a	3,280,000	4,110,000
b	2,500,000	3,920,000
c	2,000,000	2,180,000
31a	3,310,000	8,070,000
b	2,970,000	6,490,000
c	4,370,000	7,860,000
Av.	2,490,000	4,153,000

$$\text{Ratio} = \frac{4,153,000}{2,490,000} = 1.67$$

Above tests made on crude sewage at West 58th Street, Cleveland, Ohio, July, 1918.

TABLE V.

Bacteriology of Sewage. The Effect of Length of Incubation on Raw and Sterilized Sewage Counts.

	Raw Sewage.			*Sterilized.*		
	1st Day.	2d Day.	3d Day.	1st Day.	2d Day.	3d Day.
	No. 25					
A.	2,250,000	2,080,000	2,300,000	60,000	90,000	150,000
	2,140,000	1,850,000	2,010,000	40,000	40,000	50,000
	3,900,000	3,900,000	4,000,000	20,000	30,000	50,000
	2,763,000	2,610,000	2,770,000	40,000	53,300	83,300
	No. 26					
B.	1,980,000	2,270,000		60,000	60,000	
	2,180,000	2,980,000		80,000	200,000	
	4,370,000	5,570,000		80,000	150,000	
	2,840,000	3,610,000		73,000	137,000	
	No. 27					
C.	2,980,000	3,480,000	4,300,000	200,000	330,000	00,000
	2,060,000	2,410,000	2,920,000	90,000	300,000	310,000
	1,450,000	1,730,000	2,020,000	80,000	240,000	290,000
	2,163,000	2,540,000	3,080,000	123,000	290,000	300,000
	1,360,000	1,900,000	1,900,000	0	0	0
	2,170,000	4,010,000	3,620,000	0	0	0
				0	10,000	30,000
	1,765,000	2,960,000	2,760,000	0	3,300	10,000
			Averages of A, B and C.			
	2,763,000	2,610,000	2,770,000	40,000	53,000	83,300
	2,840,000	3,610,000		73,000	137,000	
	2,163,000	2,540,000	3,080,000	123,000	290,000	300,000
	2,589,000	2,920,000	2,925,000	78,700	160,600	191,000
	1	1.13	1.13	1	2.04	2.43

TABLE VI.

COMPARISON OF THE CHARACTERISTICS OF ERROR SERIES IN BACTERIOLOGICAL TESTS WITH THOSE OF COMMON STATISTICS AND MATHEMATICAL SERIES.

Description.	Lexian Ratio.	Disturbancy Coefficient.
1. Subnormal mathematical series (Poisson)	.98	$\sqrt{-1}$
2. Selected mortality series (life insurance)	1.00	0.0
3. Normal mathematical series (Bernoulli)	1.00	0.0
4. Birth series (a)	15.50	4.07
5. Birth series (b)	12.50	4.50
6. Fortunate series of ten plates on crude sewage	1.45	4.60
7. Marriage series	4.40	5.70
8. Careful series of fourteen plates on crude sewage	2.22	10.00
9. Ordinary series of ten plates on crude sewage	3.26	15.50
10. Ordinary series of ten plates on crude sewage	3.53	25.00
11. Ordinary series of ten plates on disinfected sewage	6.15	29.00
12. Daily tests for one month on crude sewage	5.30	41.00
13. Daily tests for one month on crude sewage	8.27	47.60
14. Daily tests for one month on crude sewage	9.00	49.00
15. Hypernormal mathematical series (Lexis)	7.40	50.80
16. Daily tests for one month on Lake Erie water	29.00	124.00
17. Daily tests for one month on filtered water	10.85	178.00

NOMENCLATURE AND FORMULÆ.

α = Number of bacteria per cubic centimeter.

β = Number of arbitrarily small particles of water per cubic centimeter.

s = Total number of particles per cubic centimeter, $s = \alpha + \beta$.

p = Probability of drawing one bacterium, $p = \frac{\alpha}{s}$.

q = Probability of not drawing one bacterium, $q = 1 - p$.

n = Number of cubic centimeters in each sample tested.

e = Expected Value—$e(\alpha)$ = expected value of α, etc.

ϵ = Expected Error—$\epsilon(\alpha)$ = expected error of α, etc.

N = Number of determinations.

λ = Size of error in terms of ϵ.

M = Mean value.

a_1 a_2 a_3 etc. = Number of bacteria per cubic centimeter in the individual samples of a series.

δ = Standard deviation.

L = Lexion ratio.

ρ = Charlier coefficient of disturbancy.

$$e(\alpha_M) = sp = \alpha.$$

$$\epsilon(\alpha) = \sqrt{\frac{\alpha}{n}} \text{ for a single test.}$$

$$= \sqrt{\frac{\alpha}{Nn}} \text{ for } N \text{ tests.}$$

$$M(\alpha) = \frac{a_1 + a_2 + a_3 \ldots . a_n}{N}.$$

$$\delta^2 = \frac{(a_1 - M)^2 + (a_2 - M)^2 + \ldots . (a_N - M)^2}{N}.$$

$$L = \frac{\delta}{\epsilon}.$$

$$100\rho = \sqrt{\frac{\delta^2 - \epsilon^2}{M}} \times 100.$$

◈

Annual Meeting, A. P. H. A., Chicago, Ill., December 9-12
Headquarters, Hotel Morrison
Plan Now to Go

THE NATION'S NEED OF PHYSICAL EDUCATION.

WILLARD S. SMALL,
Specialist in School Hygiene, U. S. Bureau of Education.

Address, American Public Health Association, Chicago, December 9–12, 1918.

EVIDENCE OF NEED.

1. Thirty-five per cent of the men in the first draft were rejected as physically unfit. Allowing for under-height and special sensory defects, neither of which argues general physical unfitness, not less than 25 per cent were rejected for real physical unfitness. That means 2,500,000, between the ages of 21 and 30, were unfit for military service; therefore unfit to render full measure of service in any capacity; therefore unable to get full returns from life in work and happiness. An equal number of women doubtless suffer from disqualifying defects.

2. Passing of the physical examination is no guarantee of fitness for immediate intensive military training. Only a minority of the men when they arrive at camp have the strength, endurance, agility, muscular control and versatility, and disciplined initiative necessary for the rigors of immediate intensive military training. This minority is made up largely of men who have had thorough and varied athletic experience under competent direction. The majority is lacking in one or more of the requisites. Much time is lost in purely physical training and conditioning.

3. Very few of these men know how to take care of themselves. In reply to an inquiry upon this point, one camp officer replied, with humorous exaggeration, that a few of his men were acquainted with the toothbrush. Nearly all the men are physically uneducated; many of them are physical illiterates. And yet in the words of another able camp officer, "The percentage of men, under my command, who return home safe and sound will depend more upon knowledge of how to take care of themselves than upon any other one factor."

4. Approximately 1,000,000 young men each year reach military age. If the war lasts, each year we shall be handicapped by a like percentage of rejections and of physically unconditioned men, unless effective Federal legislation is enacted.

5. There are about 25,000,000 boys and girls of school age, 6 to 18 years, marching along the great highway of youth. Numerous investigations show that at least 50 per cent of these have defects and ailments that impede normal development in greater or less degree; that they live, at home and at school, in conditions more or less unhygienic; that they lack the positive physical education—play, athletics, gymastics, work—necessary to realize their potential man and woman power.

6. One state returns 85.87 per cent of its drafted men as physically unfit; another state, only 53.33 per cent—a variation of 32.54 per cent. Between Pennsylvania and New York the variation is 16 per cent. Federal legislation would not entirely eliminate these disparities. Differences of race, social heredity and industrial and economic character are involved. It would tend to equalize such disparities and it would positively improve conditions in all states.

7. Economic disparities between states are very great. According to the best available statistics, California, for each child between 5 and 18 years of age, has property to the value of $15,000; Mississippi, $2,100. For each 100 children, Nevada has 180 men of 21 years and over; South Carolina has 58. Such disparities can be equalized only by Federal aid.

CHARACTER OF LEGISLATION NEEDED.

1. It should interpret physical education in a broad and true way, as understood by the most competent experts in school administration and in physical education. It must assume physical activity as the basic thing, but conditioned upon and integrally related with wholesome physical environment, individual physical examination and record, medical supervision of schools and school children, development of health habits and instruction in health knowledge, hygienic school management and procedure, and coöperation with all agencies that make for physical upbuilding and the moral growth inevitably incident to sane, wholesome, active physical life.

2. It must provide for boys and girls alike. From the point of view of racial strength and integrity, physical upbuilding of women is of equal importance with that of men—perhaps of greater importance.

3. It should provide for all children and youth between 6 and 18 years of age inclusive. It should extend its benefits to youth above the compulsory school age by recognition of agencies already organized for doing such work, in the whole or in part; and by extension of the continuation school principle to include and secure a program of physical education for children in industry between 14 and 18 years of age.

4. It should provide for Federal aid to enable the states to erect and carry on thorough and effective systems of physical education. This Federal aid should be limited to preparation of teachers for skilled service and payment for skilled service.

5. It should provide for studies, investigations and demonstrations for the purpose of developing progressively scientific standards in the field of physical education as interpreted.

6. It should provide for administration of the law through the established Federal and State Educational agencies; and for the coöperation of the Federal Public Health Service with the Federal Bureau of Education in the administration of those phases of the law in which the scientific resources of the Public Health Service are necessary. It must guard against duplication of effort and conflict of interest.

7. It must guarantee the autonomy and initiative of the states. It must be so framed as to permit latitude of administrative procedure according to the genius and traditions of the several states and to encourage initiative and flexibility in the development of educational methods and processes. For example the relation of education authorities and health activities within the states, in regard to administration of health supervision, should not be prescribed. The relation established between the Federal Bureaus of Education and of Health might influence the states, but it would be unwarranted interference with state prerogatives to prescribe such a relation.

8. It should place primary emphasis upon the creation and development of a plan and means for the preparation of teachers for this important educational work. No money should be expended for the payment of service until satisfactory plans have been made for the preparation of teachers.

9. It should provide safeguards for the proper and effective expenditure of the Federal appropriations, both in the use of funds for public purposes and of provisions by the states of adequate supplementary funds and equipment.

RELATION TO MILITARY TRAINING.

1. The program proposed is not a substitute for military training; with respect to boys, it is pre-military training. It is

a program for producing physically fit boys and girls during the period of immaturity. The program stops at eighteen years of age. Efficient military training should begin not earlier than eighteen years. If universal military training should be adopted, this program would insure maximum preparation of a maximum number of young men for military training.

2. It is not exclusively preparatory to military training. It is for both sexes. It is for the strong and the weak. It is for efficient living, not merely for one function of life.

3. It would prepare for military training in the following ways:

(1) By selection of boys for military training:

a. Through recurrent physical examination during the growth period.

b. Through early detection and correction of remediable defects.

(2) By graded training:

a. A graded program of exercises, scientifically selected and administered, for all children of school age.

b. Corrective gymnastics for special postural and muscular defects.

c. Intensive physical training for the older boys who are potentially fit for military service. Athletics is the most effective instrument., The commander of one of the army training camps writes: "I have observed that athletes assimilate discipline quicker than any other class of men."

(3) By training in health habits, instruction in health knowledge, development of health ideals leading to a physical conscience.

(4) By increasing the physical efficiency of those fit for limited service only.

a. By early detection of defects.

b. By specialized training of such individuals.

c. By keeping them out of inappropriate occupations.

What Will It Do for the Nation?

What such a program, wisely administered, will do for military efficiency, it will do equally for efficiency in all civil functions. It will do for girls what it will do for boys. It will raise the positive coefficient of the physical life of the nation. It will build morality upon the solid foundation of physical soundness and vitality. It will be a powerful influence in Americanization. The democracy of the playground admits of no hyphenism of language; and the morality of the athletic field, fair play and respect for the rules of the game is the very essence of Americanism.

It will not do the impossible. It will be only one of the social agencies in the immortal conflict between human progress and human retrogression. Good housing, adequate food, and sane regulation of juvenile labor are equally necessary. The enactment and operation of such a law as proposed for physical education will be a powerful stimulus and support to these other movements.

The poignant words of an editorial, "The Wasted Years," in the conservative *London Nation* (September 23, 1916) might well be our own confession and pledge of reparation:

"The war has brought home to most of us a sense of guilt and shame in regard to this dreadful waste of the vigor and the happiness of the race. . . No self-respecting nation can go back after this war to the state of things which makes the proper development of the body and mind the luxury of a small and privileged class. This reparation at least we will make to the thousands to whom their country has given nothing and from whom she has taken their all. It shall never again be said that it is not until they are needed for the terrible uses of war that any care is taken of the mass of the youth of the country."

THE SEWAGE DISPOSAL PROBLEM IN CHICAGO.

C. D. Hill,
Engineer, Board of Local Improvements, City of Chicago.

To be read before the Sanitary Engineering Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

SEWAGE disposal in Chicago is by the dilution process. The raw sewage of Chicago and its environs is discharged either directly into the Main Channel of the Sanitary District of Chicago, or indirectly by means of Chicago River, its branches, or other adjuncts of the drainage system. None of the sewage from the territory extending from the northern limits of Cook County to the State Line of Indiana is discharged into Lake Michigan, with the exception of that from a portion of the city of Evanston, where intercepting sewers are now being constructed that will divert this sewage from the Lake to the North Shore Channel, and with the exception of sewage contaminated water from the Calumet River. The Sag Channel, which is nearing completion, and the Calumet Intercepting Sewer System, which is now under construction, will eliminate this source of contamination. There still remains a very serious source of contamination from the sewage from the municipalities of northern Indiana bordering on the shores of the Lake.

The intakes of the water supply of Chicago are so located that the water is usually quite pure, but because of possible contamination the water is sterilized by chlorine so that one may drink the water without danger.

The completion of the present projects would seem to provide a complete solution of the sewage disposal problem, but, because of the growth of the city and because of the changing conditions, we will find that new projects and new methods will be needed before the present works are fairly completed. This has happened several times in the past, and it will be of interest to review briefly the history of the development of our sewage disposal works.

The Chicago River extends for a distance of less than a mile from Lake Michigan to the junction of the North and South Branches. From this point the North Branch extends northerly and northwesterly, and the South Branch extends southerly and southwesterly. The surrounding territory is a low flat plain with high ground in the distant northwest and southwest. Between these high grounds a low plain extended westerly and southwesterly, and in times of flood the southwest branch of the river was formerly continuous, with a corresponding branch of the Desplaines River, so that in early days, in flood times, one might pass by boat from the Chicago River to the Desplaines River and thence down to the Illinois.

In the extreme southern part of the present city of Chicago is the Calumet River, which drains a considerable portion of northern Indiana as well as northeastern Illinois. This river lies in a low marshy plain and at times of flood has been connected with the waters of the Desplaines through the Sag.

The first named connection between the Chicago and Desplaines Rivers was made the location of the old Illinois-Michigan Canal, the construction of which was started prior to 1850 and which has been paralleled more recently by the main channel of the Sanitary District of Chicago. The second connection between the Calumet and Desplaines Rivers was made the location of the old Feeder

Canal which supplied water to the summit level of the Illinois-Michigan Canal, and is the location of the Sag Channel which is now being constructed to connect the Calumet River with the main channel of the Sanitary District.

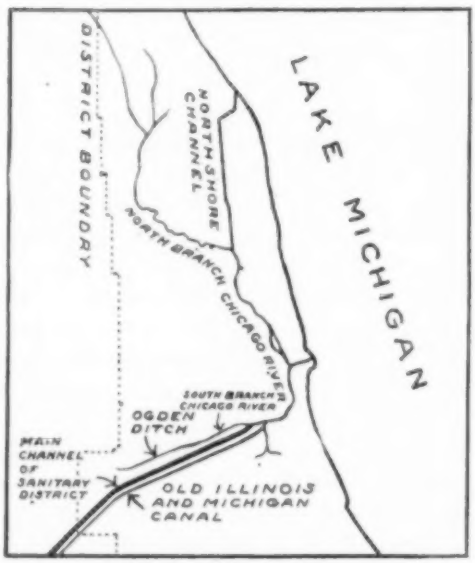


FIG. 1. Chicago River and Drainage Channels.

When the first sewers were built in the City of Chicago in 1855, the city extended approximately two miles north and two miles south of the Chicago River and approximately two miles west of the Lake. These first sewers all discharged into the river, or into the South Branch. Later, and prior to 1890, as the city grew, other sewers were built, all of which discharged into the river or its branches, with the exception of sewers in 12th Street, 22nd Street and 35th Street, which discharged into the Lake. During the latter years of this period, however, suburban villages north and south of the city, which have since been incorporated into the present city, constructed sewers discharging into the Lake, although so far as it was practicable all suburban villages discharged sewage into the river or its branches.

From the beginning of the construction of the sewerage system of Chicago it was understood that this method of disposal of the sewage would result in a foul condition of the river. Our first City Engineer, Mr. Cheseborough, considered various remedies for this condition One was cutting a canal across the city from the Lake to the South Branch, approximately along the line of 16th Street, and another was the construction of a conduit along the line of Fullerton Avenue, from the Lake to the North Branch. This conduit was built in 1872. It was intended that water should be forced through these passages from the river to the Lake, thereby causing an inflow of water through the main river.

Mr. Cheseborough also considered discharging the water from the South Branch of the river into the Illinois-Michigan Canal, which had recently been completed. The summit level of the canal at its connection with the South Branch was five or six feet higher than the water level of the river. This plan was adopted and pumps were installed to discharge the water from the South Branch into the canal. By the time this project was put in operation the river had become so foul and the capacity of the pumps was so small that the dilution of the sewage was insufficient to produce any perceptible effect.

In 1865 an Act of Legislature authorized the city of Chicago to deepen the bed of the canal along the summit level so as to produce a steady flow by gravity from the river through the canal. This was supposed to solve the problem, but soon after the completion of this project it was found that the flow was insufficient. In 1881 an Act of Legislature provided for the construction of a large pumping station at the junction of the river and the canal. This station was erected and put in operation in 1886 and continued in

operation until 1900. The pumps had a capacity of about 50,000 cubic feet per minute. The effect of the pumps was to prevent the flow of water from the Chicago River into the Lake, except in times of severe rains, and produced very slight dilution of the sewage in the river, the river being very foul at all times.

In 1885, the year before the pumps were put in operation, an unprecedented rain storm produced a flood which caused the Desplaines River to overflow into the South Branch. At the same time a large flood came down the North Branch and the combined floods flushed the Chicago River and both branches, carrying a vast amount of filth into the Lake. As a result of this condition a Water Supply and Drainage Commission was appointed to recommend the construction of such works as might be needed.

This Commission, headed by Rudoph Hering, recommended the construction of the Sanitary District Channel and its adjuncts substantially as it now exists. The recommendations of the Commission were incorporated in an Act of the Legislature in 1889. Work was started in 1890 and the main channel finished so that water passed through it in 1900. Since then the limits of the original district have been extended to the north to the limits of Cook County, and have been extended to the south several miles beyond the southern city limits.

As a result of the annexation of territory in 1889, the area of the city was increased from about forty square miles to nearly two hundred square miles. The development of the annexed territories north and south of the old city resulted in the construction of additional sewers emptying into the Lake and a largely increased flow through the sewers previously constructed.

The city of Chicago continued the policy of building sewers in the suburban districts discharging into the Lake, although at the same time the Sanitary District was spending money to divert all sewage from the Lake.

In 1896 the city of Chicago adopted the policy of constructing intercepting sewers along the shores of the Lake so as to divert all of the sewage from the Lake and discharge it into the Chicago River or its branches. This policy, however, was limited on the South Side to 87th Street, that being the southern limits of the Sanitary District at that time. South of 87th Street sewers were built and have continued to be built which discharge directly into the Calumet River.

After the extension of the limits of the Sanitary District the sewage from the municipalities north of the city was collected by means of an intercepting sewer and was brought down to the northern limits of the city of Evanston and there discharged into the North Shore Channel, which is a prolongation of the North Branch of the Chicago River. This channel has a connection with Lake Michigan at Wilmette through which water is pumped from the Lake into the channel thereby producing a flow which dilutes the water of the North Branch of the Chicago River. At the present time intercepting sewers are being built in the city of Evanston which will divert its sewage from the Lake to the North Shore Channel.

In the Calumet District work has been in progress for some years on the construction of the Sag Channel which will connect the Calumet River with the main channel of the Sanitary District. This channel is necessarily small in capacity, while the storm flow of the Calumet River at times is very great. This makes it necessary to divert all sewage from the Calumet River, and intercepting sewers are now being built which will accomplish this purpose, the sewers discharging

into the Sag Channel just below the point of connection with the river.

The Act of the Legislature, which provided for the construction of the Sanitary District Channel, required 300,000 cubic feet of water per minute to pass through the channel for the purposes of dilution at the time the channel was first opened, and required 600,000 cubic feet per minute when the population of the district should increase to 3,000,000.

The channel as originally built through the rock section had sufficient capacity for this maximum flow, and through the earth section, while its original capacity was that of the minimum amount, it has since been widened so as to provide for the maximum flow. When the channel was first opened a permit was granted by the United States authorities for a flow of 250,000 cubic feet per minute through the Chicago River. This was supposed to be the maximum amount that could flow through the river at that time without interfering seriously with navigation. Since that time the river has been deepened and straightened and in some places widened so that with a maximum flow there would be little, if any, interference with navigation. The federal authorities, however, insist that the limits of the original permit still apply and that there is serious objection to permitting an increase because of the danger of lowering the level of the Lake. The fact that the level of the Lake today is considerably higher than it was in 1900 when the channel was first opened does not appear to affect the argument.

The experience of the past fifteen years indicates that the rate of dilution recommended by the Commission was barely sufficient to provide for the sewage from the population of the district. This rate, however, did not take into consideration the gross pollution from industries, and the actual condition of the water in the channel for the past few years has not been satisfactory, principally because of the vast amount of filth discharged into the channel from industries and particularly from the Stock Yards district. The pollution of the water that is discharged into the Desplaines River and Illinois River is sufficiently great to justify complaints from residents of the state living along the borders of the rivers; this is in despite of the fact that at times a larger flow is maintained than was contemplated under the terms of the original permit from the Federal authorities. There is serious danger that the Federal Government will not permit the increased flow that is needed and may indeed restrict the flow to an amount that would be entirely inadequate.

These conditions have led to numerous negotiations with Federal authorities and to the instigation and prosecution of litigation, but no results have been obtained either from the negotiations or from the litigation. At the same time the Sanitary District of Chicago has made continuous studies of the problem, particularly with respect to various methods of sewage purification that might be installed in case the Federal Government should not permit the necessary dilution. These studies were appropriate even though the Federal Government should permit the maximum flow through the channel, for the reason that the time is approaching when the population of the city will exceed that which was contemplated by the Commission which recommended the present works.

The Sanitary District has made a series of investigations as to the treatment of industrial waste and particularly the waste from the Stock Yards district. Definite conclusions have been reached as to the method of treating the waste from the Stock Yards district, and negotiations are pending as to allotment of

the cost of establishing and operating such purification works.

The situation today is quite critical. The Federal Government may restrict the flow from the Lake so that it will be impossible to dilute the sewage to the extent required by the Act of 1889. Under this condition the state would be justified in objecting to the discharge of the grossly polluted water from the canal into the Desplaines River, and requiring the construction of supplementary works for treatment of the sewage. To build new treatment works that would purify the sewage sufficiently so that with the limited dilution of lake water the affluent would not constitute a nuisance, would require years and would cost so much that it would be necessary to obtain legislation.

There is a lack of appreciation on the part of the general public in Chicago of the seriousness of this situation. Few people realize the opposition of Federal officials to the operation of the channel in accordance with the original plan, and fewer realize the opposition to Chicago from the people of other cities along the Great Lakes. This opposition is due largely to a mistaken notion as to the effect of the flow of water through the channel upon the level of the lakes; nevertheless, it is real.

If we should be so fortunate as to obtain from the Federal Government permission to operate the channel at its full capacity, it will be difficult to make the people of this community understand that, because of the growth of population and the consequent increase of pollution of water, it will be necessary to install auxiliary purification works, and once more we will repeat history by showing by actual conditions the inadequacy of present methods long before new works can be installed.

One thing should be made plain and that is that there has been made no serious mistake in the successive steps through which the sewage disposal works of Chicago have evolved, except the mistake of procrastination. Each step has been logical and reasonable, and to have attempted other methods would probably have been unwise.

At the time the present works were planned there was strong argument on the part of a few progressive engineers that the construction of a large canal providing for dilution was unwise and extravagant, and that a much better plan would be to build sewage purification works. If such a plan had been followed, the method of purification adopted would probably have been obsolete before the work had been fairly started, and if Chicago could have changed its work as often as the engineering profession has changed its opinion as to the most effective method of sewage purification, the works would have undergone a continuous process of rebuilding.

It is quite possible that the best method of sewage treatment has not yet been developed. However, we are fast approaching the day when some method supplementing dilution must be adopted.

◈

DISSOLVED OXYGEN AS AN INDEX OF THE POLLUTION OF NEW YORK HARBOR.

KENNETH ALLEN,
Sanitary Engineer, Board of Estimate and Apportionment, New York City.

To be read before the Sanitary Engineering Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

EVER since the appointment of the New York Harbor Pollution Commission in 1903, a systematic attempt has been made to keep track of the pollution of the harbor water. The Metropolitan Sewerage Commission, Dr. George A. Soper, President, recognized the value of dissolved oxygen determinations as a measure of the digestive capacity of the water and, inversely, of their pollution, and tests begun by the commission in 1909* have been continued by the Board of Estimate and Apportionment of the city, of which Nelson P. Lewis is Chief Engineer, to the present time.

The results of these tests are very significant and show a surprising and persistent decline in the degree of saturation in all parts of the harbor, especially in the Harlem and Lower East Rivers. As is recognized by sanitary engineers conversant with the situation, this is a matter of considerable importance to the welfare of this great seaport and especially to those living or owning property in the vicinity of its shores. The purpose of this paper is to show to what extent the pollution of the main parts of the harbor has progressed as made manifest by determinations of dissolved oxygen.

In all, 2,342 samples were analyzed by the Metropolitan Sewerage Commission and 1,859 by the Board of Estimate and Apportionment. In the interpretation of results a distinction must be made between the tests made in cold weather and those made in summer. Figure 2 shows in a very rough way about the way in which the saturation figures vary at different points and at different seasons. It is seen that while there is a progressive decrease in the warm weather saturations, the winter figures remain high throughout. Even as late as April this holds true, as will be seen by Table I.

* A limited number of tests were made by the commission in 1906.

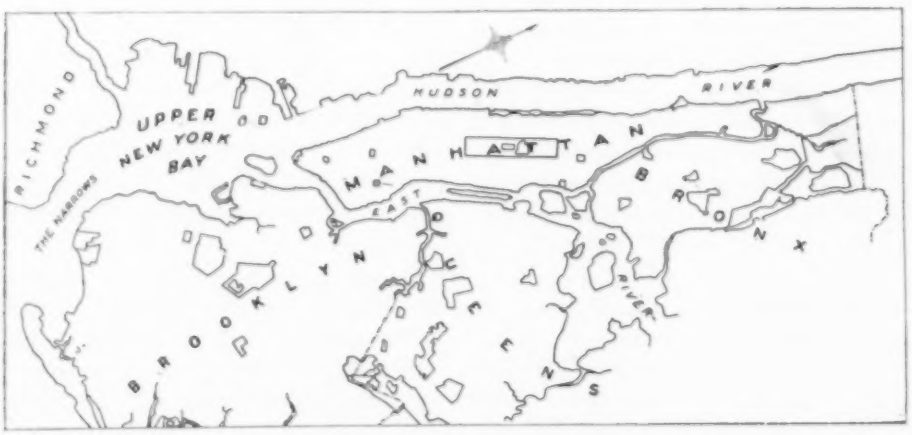


FIG. 1. Map of the Hudson River and New York Harbor.

TABLE I.

AVERAGE SATURATIONS OF DISSOLVED OXYGEN IN APRIL, 1918.

		Per. Cent.
Hudson River	Pier A	71.8
	42d St.	70.8
	155th St.	70.8
	Dyckman St.	72.0
	Spuyten Duyvil	73.3
Harlem River	Spuyten Duyvil	75.3
	Morris Heights	76.5
	151st St.	69.8
	Willis Ave.	79.0
	106th St.	75.0
East River	42d St.	76.0
	23d St.	79.3
	Pier 10	77.7
Upper Bay	Mouth of Gowanus	75.5
	Robbins Reef	76.5
	Bell Buoy 2G	62.0
	The Narrows	77.0
Kill van Kull	B. & O. Dock	68.0
	Shooters Island	65.5
Arthur Kill	B. & O. Bridge	64.5

The general conclusion to be drawn from this is that *there is no danger of the development of putrefactive conditions with their attendant odors in any of the main bodies of water in New York Harbor during the cold months of the year.* And, as a corollary, it follows that for an indefinite time no steps to prevent such putrefactive conditions *during cold weather* will be necessary. In fact, the saturation figures are so high that even fish life, which in general may be said to require about 50 per cent dissolved oxygen, is not likely to be seriously affected.*

The significant determinations are therefore those made during the warm months, and for our purposes those confined to the months of June, July, August and September only have been compiled

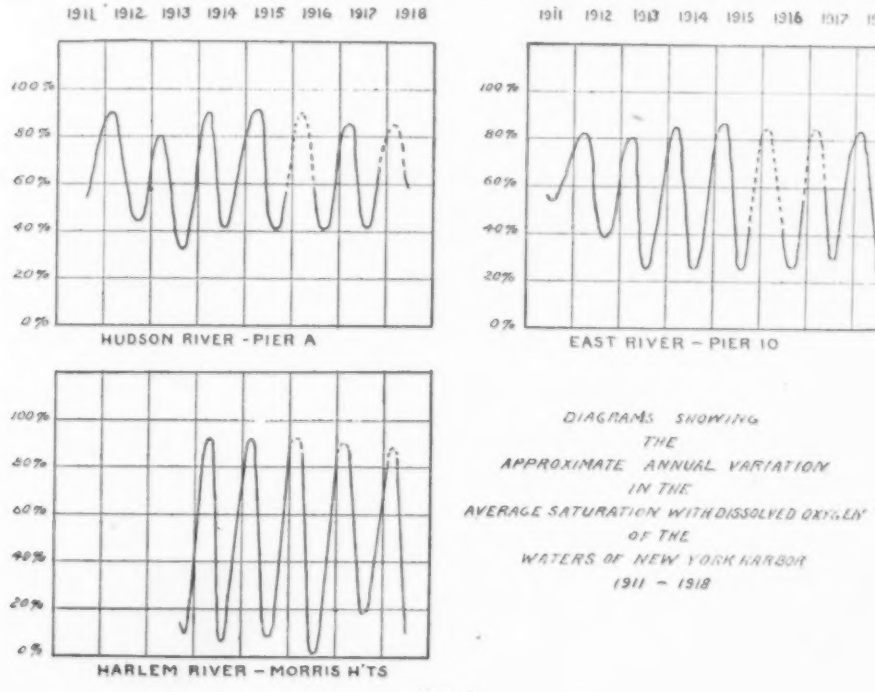


FIG. 2.

The lowest average percentage of saturation is seen to be 62, in the Upper Bay, while the others range up to 79 per cent—a condition of the water that in this regard may be called entirely satisfactory.

* While this is true of the main channels it does not apply to certain locally-polluted points. For instance, a complete depletion of dissolved oxygen was found near the head of Newtown Creek last winter when the surface was largely covered with ice.

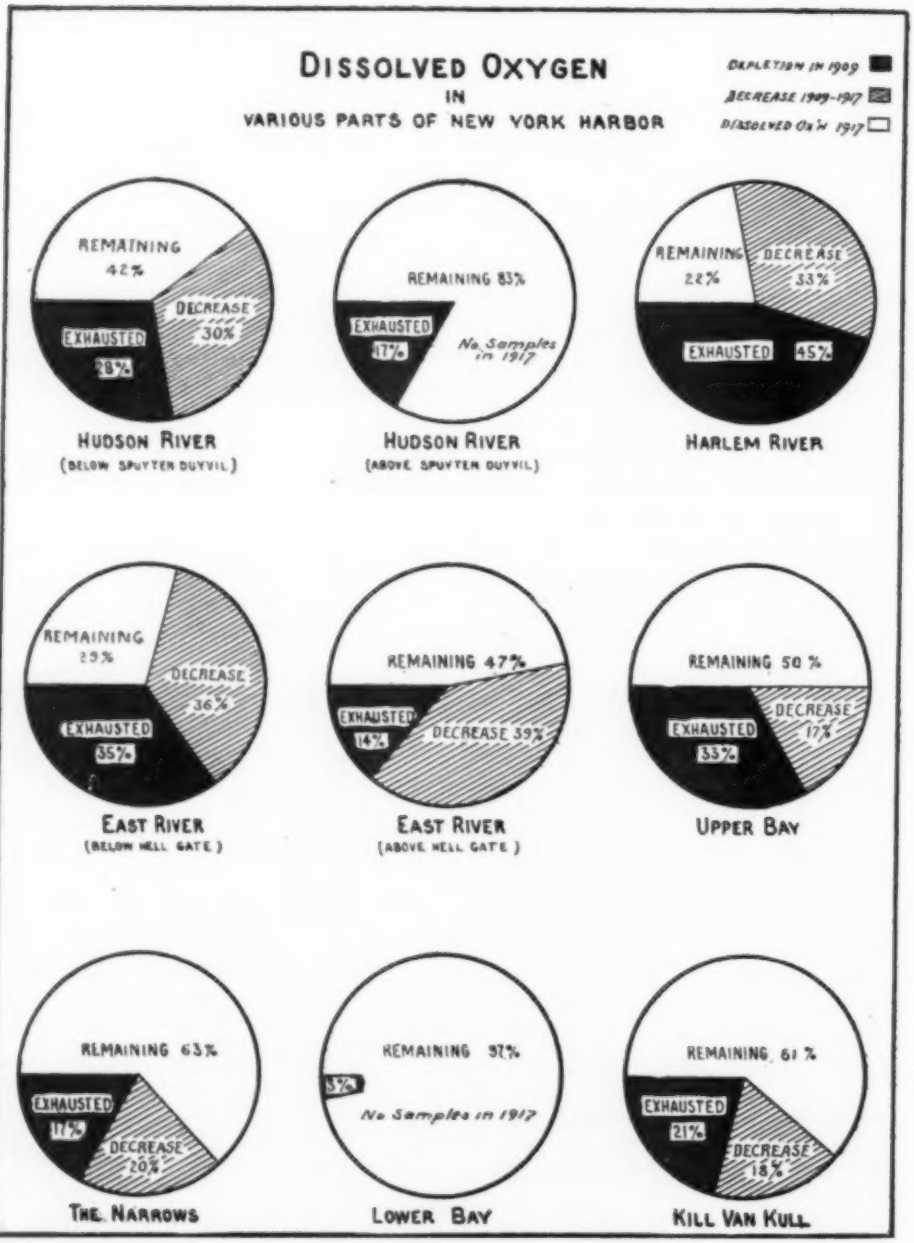


FIG. 3. Note: These diagrams are based on the analysis of 648 samples collected between June 1 and October 5, 1909, and 264 samples collected between June 1 and October 1, 1917.

(with a few exceptions prior to 1914 as noted) and the averages at certain points given in Table II and the diagrams in Figure 3.

TABLE II.

AVERAGE SATURATION OF DISSOLVED OXYGEN IN THE MAIN BRANCHES OF NEW YORK HARBOR.

	1909*	1911*	1913*	1914	1915	1916	1917
	%	%	%	%	%	%	%
The Narrows	83	76	69	68	78	63	63
Upper Bay—Robbins Reef	67	72	66	71	72	64	50
Hudson River	72	62	57	50	43	46	42
Harlem River	55	42	29	30	28	24	22
Upper East River	86	69	..	50	..	..	47
Lower East River	65	54	43	40	33	26	29

The latter show graphically the general increase of pollution in the harbor. Stated roughly, we may say that *in the Harlem River and the East River there is but half as much dissolved oxygen in summer as there was in 1909, and in the rest of the harbor but about three-fourths as much as in that year.* The increase in population during this period directly tributary to the harbor (omitting New Jersey) during this period, which is the chief contributing factor in the depletion of oxygen, is shown in Table III.

TABLE III.

ESTIMATED POPULATION OF NEW YORK CITY DIRECTLY TRIBUTARY TO CERTAIN MAIN BRANCHES OF THE HARBOR.

	1909	1917	Per Cent Increase
Upper Bay and Narrows	526,000	712,000	35
Hudson River—Lower	711,000	855,000	20
Harlem River	620,000	833,000	34
Lower East River	2,107,000	2,709,000	28

Now, while odors may occur with the discharge of large volumes of septic sewage or by the generation of gas bubbles by fermentation of the underlying sludge, they are not *produced* in polluted water until the dissolved oxygen is entirely used up. The change is then rapid to the putrefactive stage with its repulsive odors. The importance of avoiding this condition is evident, and it follows that *minimum* saturations are of prime significance. These, for several points in the harbor, are given in Table IV and are shown graphically in Figure 4.

TABLE IV.

MINIMUM DEGREE OF SATURATION WITH DISSOLVED OXYGEN OBSERVED AT CERTAIN STATIONS IN NEW YORK HARBOR.

	1909	1911	1912	1913	1914	1915	1916	1917
	%	%	%	%	%	%	%	%
The Narrows	65	62	61	43	45	54	48	46
Robbins Reef	62	64	53	38	70	58	51	42
Hudson River:								
Pier A	57	49	51	25	31	25	29	25
155th St	55	57	..	..	36	22	25	20
Spuyten Duyvil	55	68	..	50	64	35	28	..
Harlem River:								
Morris Heights	..	46	..	..	6	8	0	1
Willis Avenue	54	29	..	..	0	6	1	0
Lower East River:								
23d St	52	..	..	39	28	19	8	10
Pier 10	52	49	49	13	19	22	17	19

As the worst conditions naturally occur near sewer outlets and at other points near the shore where currents are retarded and where deposits of sludge have formed, we may infer from these figures that:

a. *The conditions in the Lower East River and the Harlem River are such that local nuisances from foul odors may be looked for at any time after several days of very hot weather.*

b. *The conditions in certain parts of the Hudson River and of the Upper East River are approaching those that already obtain in the Lower East River.*

*A few of these samples were tested between October 1 and June 1.

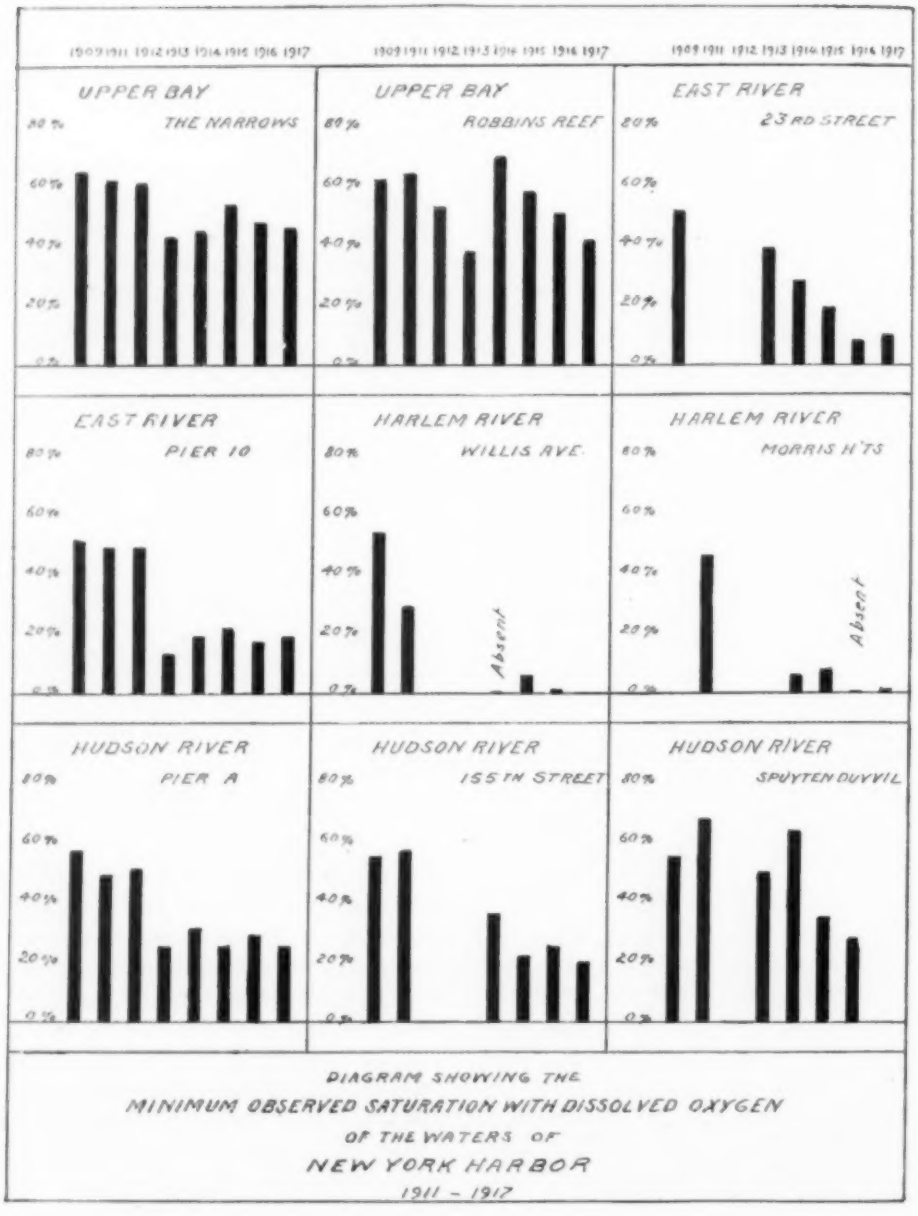


FIG. 4.

In Less than Three Weeks:
Annual Meeting, A. P. H. A., Chicago, Ill., December 9-12
Be There!

VACCINATION AS A WAR MEASURE.

MAURICE OSTHEIMER, M. D.,
Assistant Diagnostician, Bureau of Health, Philadelphia, Pa.

To be read before the Public Health Administration Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

NO one will dispute the fact that the health of our army and navy is paramount when the country is at war. But close behind this stands the health of the civil population. Smallpox has become prevalent throughout the United States since this war began. It is most important, therefore, not only that the vaccination laws existing in the several states be rigidly enforced, but also that new regulations must become necessary to cover circumstances which could not have been foreseen before the war. Just as one finds nowadays a few well-meaning though misguided individuals, who conscientiously object to fighting, so, too, there has existed a small but noisy band who object conscientiously to vaccination. That such persons have been able to influence some of the lawmakers of some of our states is most unfortunate. Our boys "over there" are fighting for all that is right; ought not we here fight at least to prevent smallpox?

The intention of this paper is not to open any controversy as to method or technique. Everyone will grant that it is essential to use fresh virus, well rubbed in, on a skin surgically clean. What seems most important is that vaccination regulations be carried out rigidly. In most states vaccination is compulsory only for the child of school age. Laws concerning the vaccination of adults either do not exist or apparently are not enforced.

The attention of many communities has recently been called to this condition by the migration of workers to points where large munition plants are located. While most of these men have been vaccinated, there remains a varying percentage who have never been successfully vacinated; and these are the men who spread smallpox. In Philadelphia only five cases of smallpox were reported in 1916; twelve cases in 1917; and up to the present, in 1918 there have been already 33 cases! Isolated cases of smallpox, reported here and there, when investigated, disclose identical facts. Someone has come to work either developing or convalescing from smallpox. One or more fellow workers, inmates of his household or simply contacts, in every instance unvaccinated persons, promptly developed smallpox. Since these men often remain but a short time in any place, one migrating worker has been known to infect one or more people in two or more localities within a week or ten days. Occurrences of this kind would seem to make necessary some Federal law regulating the vaccination of adults, especially of workers migrating from place to place.

It is true that the large industrial plants, employing a staff of physicians, have been requested, both by the United States Public Health Service and the Ohio State Department of Health, to take the precaution of vaccinating the unvaccinated worker at some time near his arrival. But more or less time elapses before each man is finally vaccinated; and there is always the chance that inert virus was used. For instance, during the summer a negro boy, who had been at Hog Island working in the shipyard for five weeks, developed smallpox. Investigation disclosed the fact that he had been vaccinated on arrival; but this vaccination had not been successful. Of

course all of us know that vaccine will vary in its activity; but a good virus, kept on ice, will usually take. It is unfortunate that any industrial physician should consider his duty done just as soon as he has vaccinated each worker; whether the vaccination has been successful only comes into question in case that worker later develops smallpox.

The Federal government alone can effect some regulation to control the vaccination of laborers migrating from state to state. Would it not be practicable for the United States Public Health Service to request of the United States Railway Administration that tickets for places outside of one state be sold only to a purchaser who presents certificates of successful vaccination for each member of his party? Such certificates could be issued either by the municipal or county health officer, or by any private physician, provided such a regulation had attached to it the penalty of a fine or imprisonment or both, for the physician who should give a fraudulent certificate. One certificate would do for the man who was to make a straight trip through several states; but should he wish to stop off in more than one state, he would need several certificates, or he might procure new certificates each time he bought tickets out of a state. Facts might be hard to prove should an unvaccinated person, provided with a fraudulent certificate, carry smallpox into another state. It would, of course, be easy for a vaccinated individual to procure a certificate by giving to the examining physician the name of the unvaccinated person who later used the certificate and spread the disease. If a worker comes North with his family, certificates for each member of the family would have to be presented. In Philadelphia recently we found a large negro family, recent arrivals from the South, not one member of which family had ever been vaccinated. This explained the occurrence of seven cases of smallpox in one small house!

The presentation of such certificates might work some hardship and would undoubtedly cause some delay in departure at first; but publicity in the newspapers together with large placards at all railway stations would rapidly overcome this objection. Armed with vaccination certificates for the entire family, it would take but little longer to procure tickets to take the family away for the summer than it did previously, provided each member of the family had already been successfully vaccinated. Suggestions that all travellers be examined for successful vaccination scars by the physicians of the United States Public Health Service, either at railway stations or on trains are not practical, especially now when the war has taken away most of our medical men.

A word of caution might be uttered to those physicians on duty at the industrial plants, asking them not only to examine with care for vaccination scars, but to vaccinate all doubtful applicants and to keep these men under observation, having each one report one week later for reexamination, and for revaccination should the first attempt have failed. For the health of the munition worker is fully as important as is that of the fighting man! Carefulness of this kind should help reduce our outbreaks of smallpox.

Finally, then, I would beg to propose the following: That the chairman appoint a committee (of three or five) to draw up a resolution requesting the Surgeon-General of the United States Public Health Service to put into practice this or some other practical method, to secure the vaccination of all unvaccinated adults, and thus to eliminate smallpox from the United States.

THE 1890 EPIDEMIC OF INFLUENZA IN CHICAGO AND ITS INFLUENCE ON MORTALITY, 1890 TO 1893 INCLUSIVE.

W. A. Evans, M. D.
AND
M. O. Heckard, M. D.,
Chicago Department of Health.

ALTHOUGH the present epidemic of influenza began in Europe several months ago cablegrams informing us of the continued or recurring prevalence of the disease in England, France and Germany are received from day to day. This prompts an inquiry into the history of past epidemics of this disease with a view to determining what we may expect in the next few years.

Hirsch's "Handbook of Historical and Geographical Pathology" records almost one hundred epidemics occurring in the eight hundred years prior to 1889. It is clearly set forth that practically each of these epidemics lasted longer than one year or else recurred several times during the course of two or more years. Consideration of this fact led us to study the record of the pandemic of 1889–93 as it exhibited itself in Chicago. The material for the study was found in the yearly reports of the Chicago Health Department for the years 1888 to 1894 inclusive.

In 1890 Dr. S. Wickersham, health commissioner, said in his annual report:

"Influenza beginning in our city early in January reached its height the last week in January at which time my belief is that over 100,000 of our citizens were sufferers from that cause alone. It continued to prevail during February, March and April in a modified degree. Its duration was about four months. In the week having the highest mortality there were 694 deaths."

In 1891 the disease recurred for we find Dr. J. D. Ware, then health commissioner, saying in his annual report, "During March and April there were 3,400 deaths in each month largely due to pneumonia and influenza which seemed to be epidemic."

No mention is made of influenza in the annual reports of 1892–93, but Dr. A. R. Reynolds, health commissioner at that time, tells us that the disease prevailed as late as 1893.

The influenza bacillus was not discovered until the epidemic was well under way and as a means of general diagnosis bacteriologic examinations were not employed. Diagnosis was by clinical symptoms. In view of the well-known influence of publicity on diagnosis our judgment is that the best basis for judgment as to the effect of influenza in 1889 to 1893 is the curve for deaths from all causes.

Diagram 1 shows the monthly distribution of deaths from all causes in 1889.

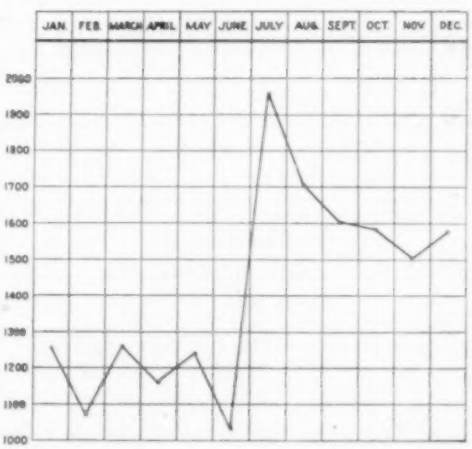


Diagram No. 1—Deaths from all causes in 1889, Chicago.

Between 1889 and 1893 the population of Chicago increased 5.2 per cent a year.

This diagram is shown for two reasons. In the first place it indicates the distribution of deaths throughout the year under normal conditions in the year just prior to the onset of the epidemic. In the second place we use the deaths per months in 1889 as a basis for the chart showing the great increase in mortality during the late Winter and the Spring. During this period the population of

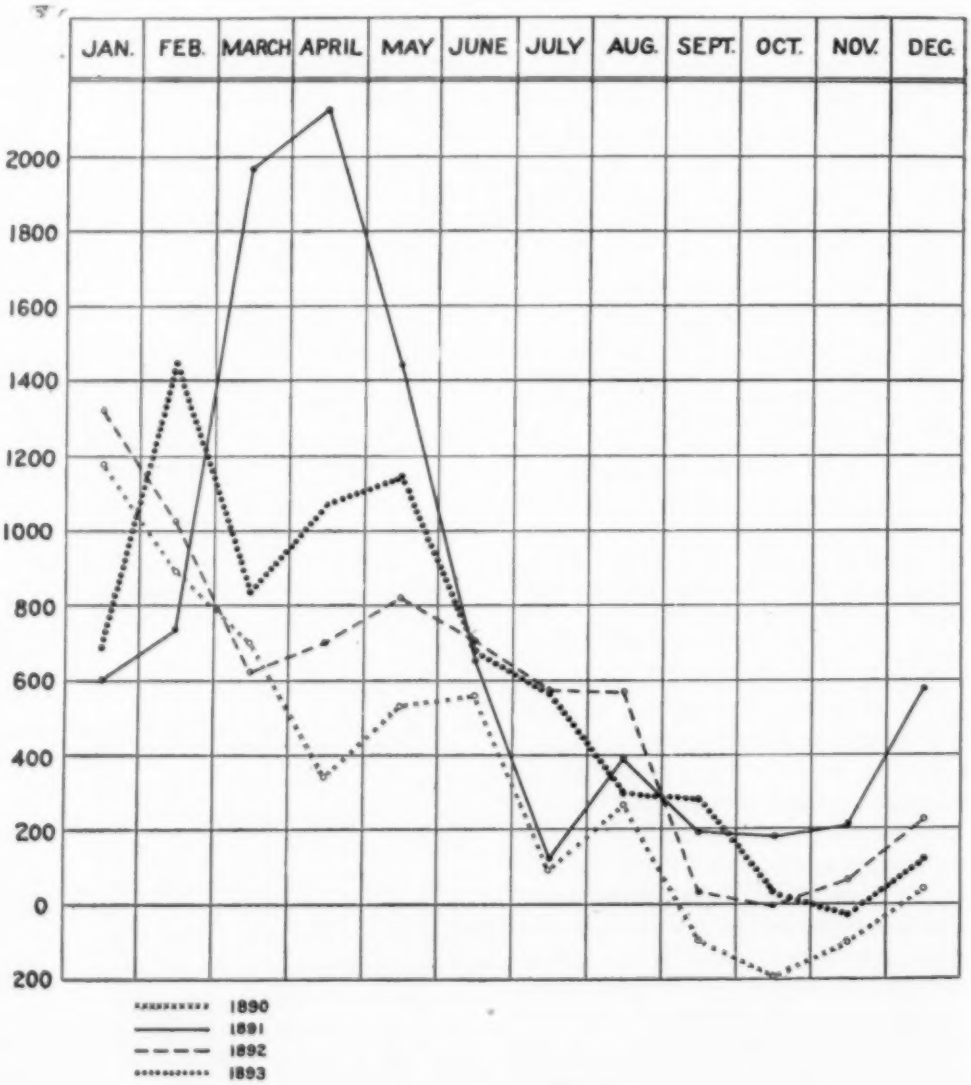


Diagram No. 2—Deaths from all causes by months as compared with expected deaths on basis of deaths in 1889 plus 5.2 per cent each year for increase in population. The zero line represents expected deaths. The lines above the zero line indicate number of deaths above the expected. Those below zero line indicate number of deaths less than the expected. Chicago.

Chicago grew at the rate of 5.2 per cent a year. To get the number of deaths normally to be expected in January, 1890, we added 5.2 per cent to the number of deaths which occurred in January, 1889. This process was repeated for each of the twelve months. To get the number of deaths expected in January, 1891, we added 5.2 per cent to the number of expected deaths for January, 1890. This process was repeated for each month. The same plan was followed in arriving at the expected deaths for the months of 1892 and 1893. In this way we established our base line for Diagram 2.

Diagram 2 shows how much the deaths each month rose above or fell below the base line. The death-rates were heavy in the respiratory disease months and light in the late Summer, Autumn and early Winter. We think that this diagram proves that the effect of influenza was felt each late Winter and Spring until and including 1893.

The gross death-rates for the several years were: 1889, 18.12; 1890, 19.87; 1891, 24.16; 1892, 21.85; 1893, 21.61; 1894, 18.26; 1895, 17.72; 1896, 16.29.

Diagrams 3 and 4 are reproductions of sections of charts found in the Report of

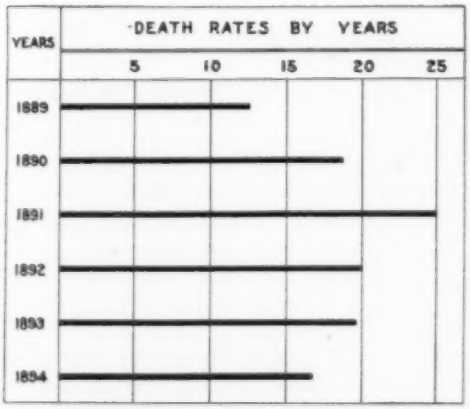


Diagram No. 3—Number of deaths from pneumonia by years 1889 to 1894. Chicago.

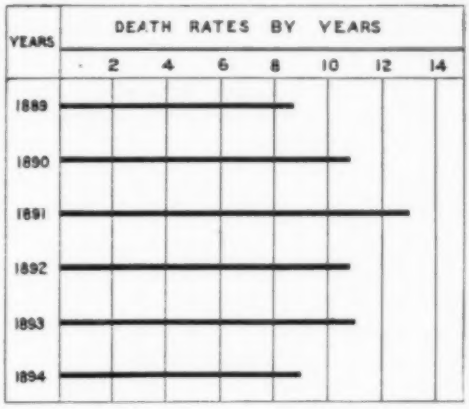


Diagram No. 4—Number of deaths from bronchitis by years 1889 to 1894. Chicago.

the Chicago Health Department for 1911. They show that the pneumonia and bronchitis death-rates rose sharply in 1890 and continued high until 1893. After 1893 the prevalence of these diseases was markedly decreased. We need scarcely add that between 1890 and 1893 physicians habitually made many clinical diagnoses of influenza and many deaths from this disease are recorded each year. Nevertheless it is our opinion that the gross deaths reflect the effect of the epidemic even more than do the records as to pneumonia, bronchitis and influenza.

Diagram 5 shows a part of the age distribution of excess deaths over normal from all causes in 1890–93. The base line was established in the same way as in the case of Diagram 2. This diagram shows that influenza-pneumonia, caused the largest excess of death over the expected in the group "over 60".*

The most significant showing on this diagram is the line for children 5 to 10. This group was picked out for entry on the diagram because it more nearly represented school children than any other

* Although the excess deaths *over normal* were more numerous in the age group "over 60", the *total deaths* were greater in the age group "20–40".

age group in the classification. This line indicates that the disease has a distinct tendency to spare children of school age. It furnishes an argument against the closing of schools as a means for controlling an epidemic of influenza.

Conclusions:

First: Pandemics of influenza usually continue for several years.

Second: The epidemic in Chicago in 1890 continued to recur or else to otherwise increase the mortality rate of Chicago up to and through 1893.

Third: The principal increases in deaths were due to pneumonia, bronchitis and influenza.

Fourth: The number of deaths was highest among persons 20 to 40. The greater increase above the expected was in death of persons over 60. Chart 5 shows that children of school age seem to enjoy some relative immunity.

Fifth: This study indicates a probability either that influenza will recur several times during the next few years or that there will be an increase in pneumonia, or both.

Sixth: This study plainly indicates a need for continued work to control the acute respiratory diseases during 1918, 1919 and for several years thereafter.

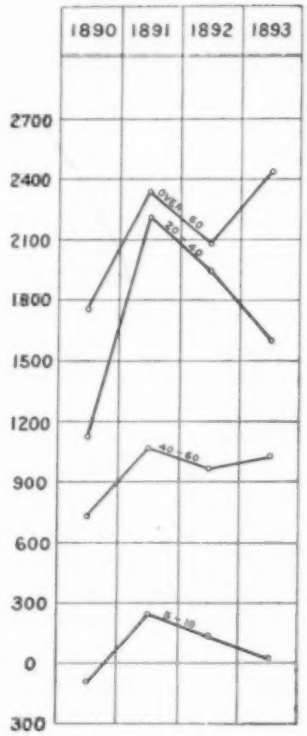


Diagram No. 5—Deaths for four years in certain age groups as compared with expected deaths on basis of deaths in 1889 plus 5.2 per cent each year for increase in population. The zero line represents expected deaths. The horizontal lines above zero line indicate numbers of death above the expected. Those below zero line indicate numbers of deaths below the expected. Chicago.

WILL YOU BE READY NEXT YEAR?

If the Influenza Epidemic should be repeated next year, will you be able to face your people and say: "I am ready?"

The highest authorities will present all of the available information regarding Influenza at the Meetings of the American Public Health Association at Chicago, December 9-12. Headquarters, Hotel Morrison.

Play safe. Prepare for next year. Do not gamble with the lives in your care.

PRELIMINARY REPORT ON THE INFLUENZA EPIDEMIC IN CHICAGO.

JOHN DILL ROBERTSON, M. D.
Commissioner of Health
AND
GOTTFRIED KOEHLER, M. D.
Assistant Commissioner of Health, Chicago.

THE influenza epidemic which has just swept across the country first manifested itself in the death-rate of Chicago on September 22, 1918. This was approximately fourteen days after the first outbreak of the disease in the Great Lakes Naval Training Station, which is located thirty-two miles north of Chicago. In the interval the disease had spread through the north shore suburban towns.

The following charts show the course of the disease to November 2, the sixth week of the disease. Chart I shows the number of cases reported daily and Chart II the number of deaths.

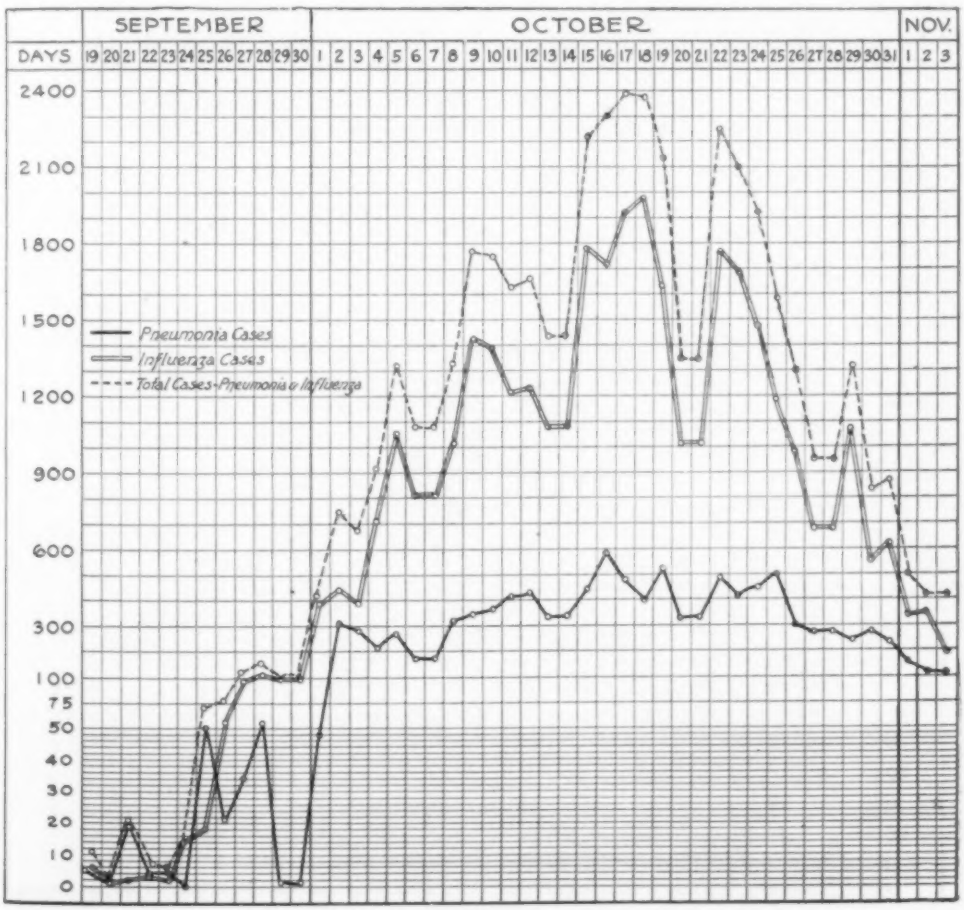


CHART I

The daily number of deaths is undoubtedly the best index of the course of the disease. Influenza was first added to the list of reportable diseases with the advent of the present epidemic. This fact, together with the stress under which physicians labored during the epidemic, renders the number of cases reported daily a less reliable guide.

The outbreak in Chicago reached its height on October 17. This was at the beginning of the fifth week and the twenty-ninth day of the disease. On that day the total number of deaths from influenza and pneumonia was 381, the total deaths from all causes 520 and the total number of new cases of influenza-pneumonia reported was 2,395. All of these figures

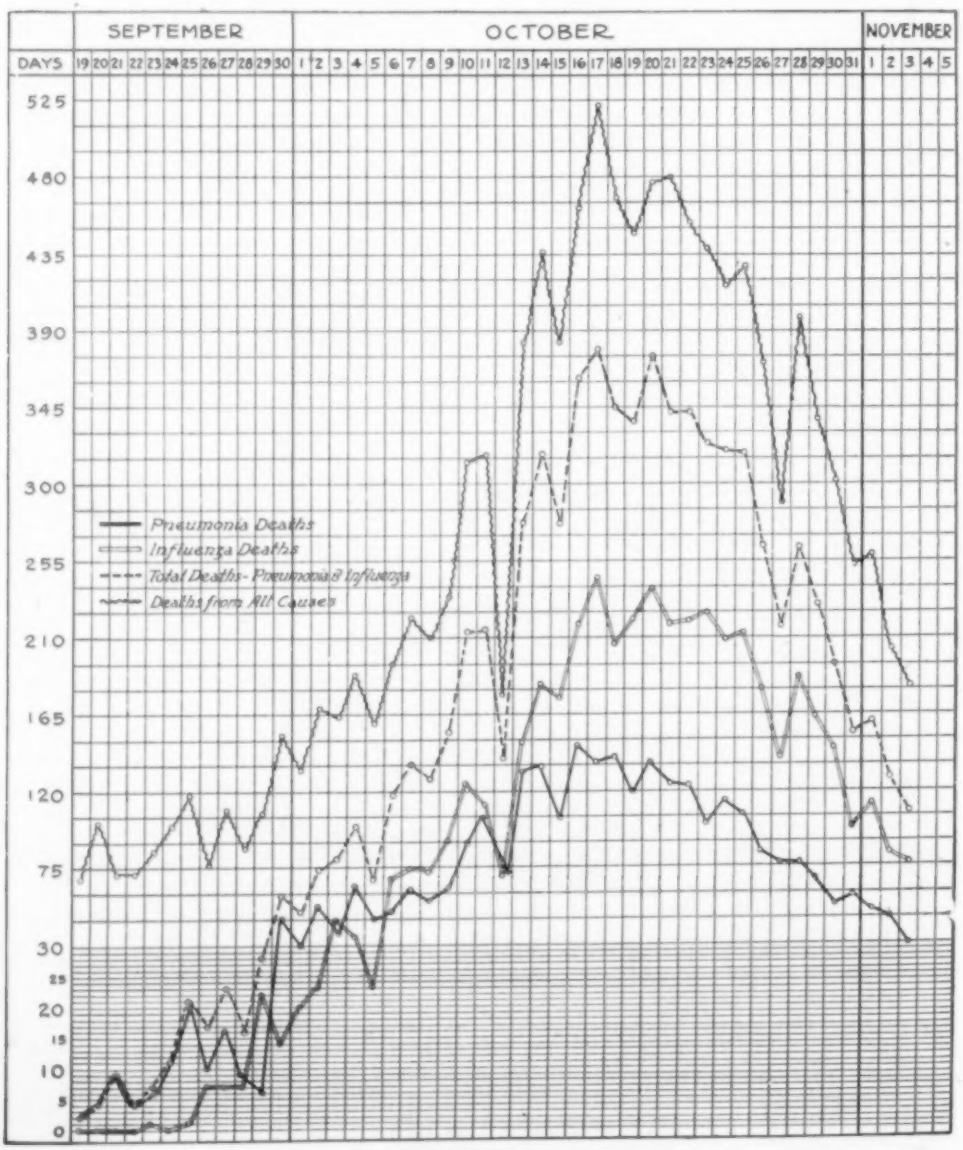


CHART II

TABLE I. ANNUAL MORBIDITY AND MORTALITY RATE PER 1,000 OF POPULATION.*

Week Ending	Cases of the Disease Reported	Deaths			Total, All Cases
	Influenza and Pneumonia	Influenza	Pneumonia	Influenza and Pneumonia	
Sept. 28	6.94	0.34	1.48	1.82	12.5
Oct. 5	64.21	3.43	4.94	8.37	20.3
Oct. 12	202.21	11.46	9.55	21.01	33.1
Oct. 19	282.47	24.93	17.33	42.26	57.6
Oct. 26	255.32	30.94	16.58	48.27	63.0
Nov. 2	138.91	20.36	9.15	29.51	44.0

* Based on United States Census Bureau estimated population of 2,596,681 for 1918.

represent the maximum number recorded in any one day during the outbreak.

The highest weekly mortality rate occurred during the week ending October 26, when the annual rate per 1,000 from all causes was 63, and from influenza and pneumonia combined was 48.28. Since the date of the greatest incidence there has been a gradual decline both in the number of new cases and the number of deaths from influenza and pneumonia and all causes. During the week ending November 2 the death-rate from all causes had declined to 44.0 and from influenza and pneumonia to 29.51.

Reduced to terms of annual rates per 1,000, the morbidity and mortality rates from influenza and pneumonia and all cases during each calendar week during the course of the epidemic were as shown in Table I.

A study of the progress of the outbreak in the city, using as an index the number of deaths from influenza and pneumonia, shows that the disease first manifested itself to a greater extent on the north side, spreading apparently to this part of the city from the north shore towns. During the first two weeks of the disease it continued to show a preponderance on the north side, in the third week, an even distribution in all parts of the city, in the

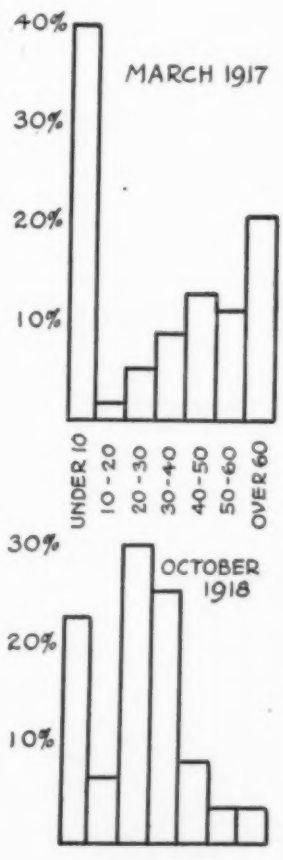


CHART III

PERCENTAGE OF DEATHS FROM INFLUENZA & PNEUMONIA BY AGE GROUPS

fourth week it spread more to the south and southwest sides, and after that affected the latter sections of the city with greatest severity.

A study of the age distribution of the deaths from influenza and pneumonia shows that the largest percentages of deaths occurred in persons between twenty and forty years and under ten years of age. The percentage distribution of all deaths from influenza and pneumonia during the month of October, 1918, by age groups is shown in the lower diagram of Chart III.

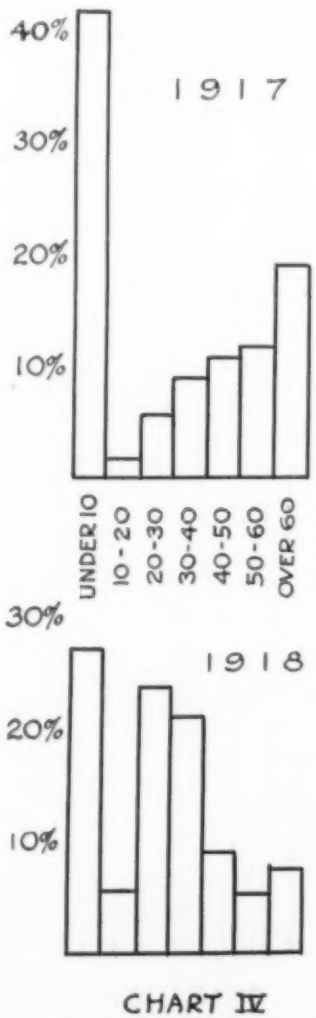


CHART IV

PERCENTAGE OF DEATHS FROM INFLUENZA & PNEUMONIA BY AGE GROUPS

The contrast is here also shown between the age distribution in the deaths occurring during the present outbreak and the deaths from pneumonia during March, 1917, when this disease was unusually severe, the annual rate being 3.61 per 1,000 during this month.

The winter of 1917 was characterized by a high pneumonia death-rate in various parts of the country. Not only the army camps, but many cities were severely afflicted by the disease. The annual pneumonia death-rate in Chicago was also unusually high in this same year and reached 3.22 per 1,000 during the first four months.

The course of the pneumonia and other acute respiratory diseases in Chicago from 1867 to November 1, 1918, is shown on Chart V. The death-rates indicated thereon include pneumonia, influenza and bronchitis.

The unusual prevalence of the disease, during the year preceding the present outbreak, noted in connection with the progress of the influenza epidemic of 1890, 91 and 92, as described by Evans and Heckard in this number of the JOURNAL, leads to the inquiry if the extensive outbreak of pneumonia in 1917 was not possibly the first year of the present influenza epidemic. The conflicting reports on the bacteria responsible for the present outbreak, together with the frequent findings of hemolytic streptococci in the pneumonias studied in 1917, offer further reason for making additional studies to determine the exact relationship of the high mortality from pneumonia occurring in these two successive years.

The dissimilarity in the age incidence shown in Chart III of the deaths from

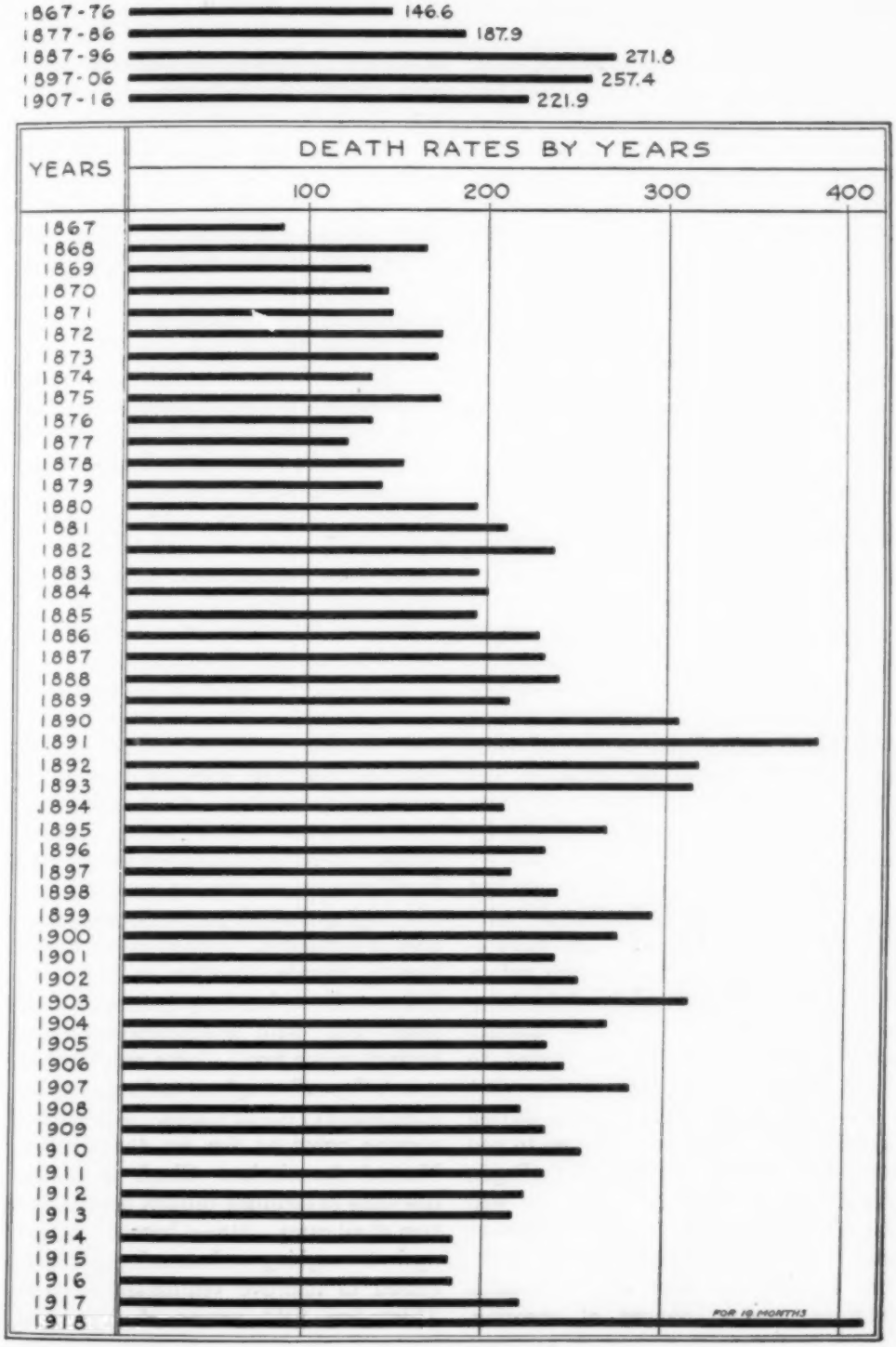


CHART V

ANNUAL DEATH RATES PER 100,000 FROM PNEUMONIA, INFLUENZA & BRONCHITIS IN CHICAGO

pneumonia in March, 1917 and October, 1918, is likewise indicated in Chart IV, which shows the precentage distribution by ages of all deaths from pneumonia and influenza occurring in the entire year of 1917 and 1918 to date. The great preponderance of children under ten years affected in 1917 and of the age group from 20 to 40 in 1918, stands out prominently in these charts. Inasmuch as influenza affects principally children and young adults (Osler's "Text Book of Medicine") does this mean that the children were affected in the first year of the outbreak and the young adults in the second year?

Summary of Measures Employed to Control the Epidemic.

Since we were fortunate enough in Chicago to pass through the present influenza epidemic with a maximum annual death-rate from all causes per week, not in excess of 63 per 1,000, it may be of interest to summarize the measures employed to control the spread of the disease. Briefly, these were as follows, on the days of the month indicated by the numerals:

September 16th—After the disease had appeared at the Great Lakes Naval Training Station, issued warning that the epidemic would spread to Chicago within two weeks. 17th—Proclaimed the influenza-like disease a reportable disease. 20th—Police Department requested to start another anti-spitting crusade. 21st—Warning issued that persons having symptoms of influenza should go to bed and not expose others. 24th—Began campaign to have all dwellings well heated and asked citizens to telephone to the Health Department if landlord did not furnish sufficient heat. Placards warning against danger of sneezing, coughing and spitting placed in all street and elevated cars. 25th—Issued warning in regard to pneumonia following influenza. 26th—The following rigid measures adopted to prevent the spread of the disease in the schools: (a) Open window ventilation of all schoolrooms. (b) Pupils warmly dressed. (c) Daily thorough inspection of all pupils. (d) Pupi's coughing or sneezing to be sent home at once. (e) Daily check on absentees in all schools. 27th—Pictures in daily papers demonstrating the use of masks. Landlords refusing to supply heat sued. 28th—Health Commissioner appointed on a committee appointed by the Medical Section of the State Council of Defense to mobilize all forces to fight the outbreak in the city and state. 30th—All street and elevated cars required to be renovated and disinfected at least once in twenty-four hours.

October 1st—Quarantine ordered for all influenza cases, also isolation of cases in hospitals. (Pneumonia has been subject to quarantine for a number of years.) 2nd—Further attention called to the value of masks by ordering same to be employed in hospitals. Masks placed on street sweepers. Visiting stopped in hospitals. 3d—Interviews given and printed in all newspapers warning against panic, also urging that all precautionary measures be continued. United States Public Health Service Circular on "Spanish Influenza" carried in papers as a half page "ad," with a subjoined warning against undue fear. Police requested to arrest "open" coughers and sneezers on streets and in public places. 4th—Home nursing provided for by the Visiting Nurses' Association. Check made on hospitals to facilitate prompt hospitalization of all cases. 5th—Churches warned against coughing and sneezing; also required to improve ventilation. 11th—Thirty-five field nurses of Municipal Tuberculosis Sanitarium Staff detailed for home nursery service to coöperate

with the Visiting Nurses' Association. 12th—Public dance halls closed. Health Commissioner meets with the presidents of forty civic organizations who agree to coöperate. One hundred and fifty health officers of the city put on full-time service at a salary of $200.00 per month, United States Public Health Service paying the difference. All sworn in as United States employees. Eighteen field nurses from Health Department Quarantine Service loaned to Visiting Nurses' Association. Public funerals prohibited. Attendance at all funerals limited to ten, and burial required from the place of death. 10th—Smoking on all cars stopped. 14th—Conference to facilitate hauling by ambulances. 15th—Theaters, skating rinks, moving picture shows, night schools and lodge halls closed. 16th—Sixteen Municipal Tuberculosis Sanitarium dispensary physicians detailed to field duty for care and treatment of families afflicted with the disease. 17th—Arrangements completed for federalizing health officers of the city; the same also to give treatment to the needy and first-aid treatment to those unable to procure a physician. The manner of obtaining this assistance announced in the public press. Street and elevated cars required to keep doors open, also windows as weather permits. Employees in down-town district ordered to and from work at various hours so as to stagger load on cars. The Influenza Commission recommends general immunization by the use of the Dr. E. C. Rosenow vaccine and appointed a commission, consisting of the professors of bacteriology and pathology in the local universities to manufacture and distribute such vaccine. Manufacture of prophylactic vaccine under supervision of the aforesaid commission begun in the city laboratory. 18th—All public gatherings not essential to the war, such as banquets, conventions, lectures, social affairs, athletic contests of a public nature stopped. Music, cabarets and other entertainments stopped in restaurants and cafés. Crowding prohibited in poolrooms, saloons, etc. Assistance of the school board enlisted to help health officers in carrying out measures which have been employed since the outbreak of the epidemic to guard the health of school children. These measures have been carried out in lieu of closing the schools. 19th—Hospitals canvassed with a view of getting more space for influenza cases. Report received from a representative of the department sent East to study vaccines used there. 20th—Conference with superintendents of all hospitals to arrange for additional space for influenza cases. Ordered that no surgery, except emergency surgery, should be done until further notice. 21st—Further efforts made to cope with shortage of nurses. Request made that physicians send all women over forty, willing to serve as housekeepers in afflicted homes, to the Health Department for registration and reference to the Visiting Nurses' Association. 22d—Rosenow vaccine received from Rochester ready for distribution. Issued in order of preference to draft boards, hospitals and nurses, industrial plants and general public. 23d—In conference with laboratory men

VACCINE DISTRIBUTED TO NOVEMBER 3 AS FOLLOWS:

October 22	2,813 cc.*
23	2,183 cc.
24	8,206 cc.
25	4,131 cc.
26	5,925 cc.
27	272 cc.
28	8,232 cc.
29	2,288 cc.
30	66 cc.
31	11,628 cc.
November 1	9,765 cc.
2	6,033 cc.
3	48 cc.

* One cc. is the average amount of one dose. Three doses required at weekly intervals.

of all hospitals and laboratories. Urged that they make preparations at once to collect and administer immune human serum. 24th—Check up on street cars to see if all available cars are used so that crowding be reduced to minimum. 25th—During cold spell the public warned to wear heavy clothing, also warned as to the dangers of cold and wet feet. 29th—Ban lifted on music and usual entertainment in restaurants. 30th—Theaters allowed to reopen on north side of the city, the next day in the middle and business section, and later on the south side portions of the city. Thorough renovation of all theaters required as a condition for a permit to reopen. Two-minute health talks given at each performance, and watch kept on coughing, sneezing and spitting. Ban also lifted on other pub'ic meetings in theaters and assembly halls on the same date as for theaters, but all theaters and meetings allowed to reopen required to close at 10 p. m.

November 4th—Ban lifted on social functions, entertainments and athletic contests. Public dance halls, skating rinks and lodge halls allowed to reopen after thorough renovation and inspection, and approval by the Department.

◆

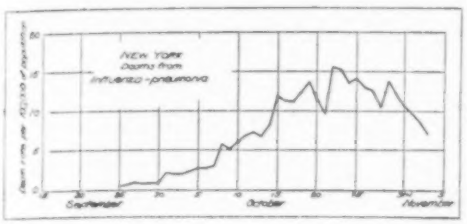
Recent Public Health Work.—Dr. Joseph Priestley, Medical Officer of Health for Lambeth, England, reviews the recent progress in public health work as outlined in the forty-sixth annual report of the Local Government Board, for 1916–1917.

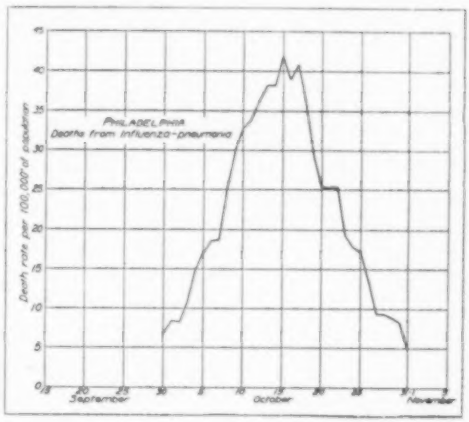
With the single exception of measles, all the other infectious diseases were under complete control. Many anthrax cases were traced to infected shaving brushes which had been made of Chinese horse hair. A large amount of food inspection has been done, due essentially to the needs of the army. Anti-tuberculosis work remains, however, in a state of *status quo* because so many able tuberculosis workers are in the army service. On the other hand maternity and child welfare work has made unusual progress. During 1916–1917, the infant mortality rate was the lowest on record. The results on the dried milk experiments are reviewed, and it is stated that dried milk is a valuable food and can even be used as food for infants. Steps have also been taken to insure an adequate and safe drinking water supply in factories and workshops, where twenty-five or more persons are employed. It is recommended that the bubbling fountain, which throws the jet of water at an angle, should preferably be used. The Ministry of Health which has been formed will combine and coördinate all the public health activities conducted by the national government under one head. Lastly, it is urged that the health of the munition worker be safeguarded in every way. This is the result of a very extensive investigation into the subject of industrial hygiene, sanitation and welfare, which was conducted by a special committee, appointed in September, 1915.—The *Practitioner*, September, 1918, London, England. (*M. P. H.*)

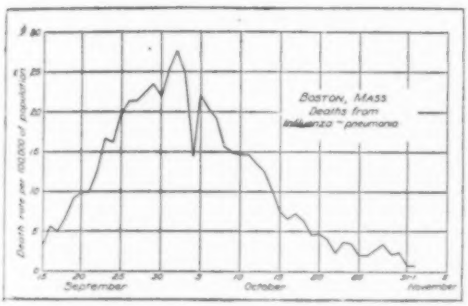
PROGRESS OF THE INFLUENZA EPIDEMIC IN THE LARGER CITIES OF THE UNITED STATES.

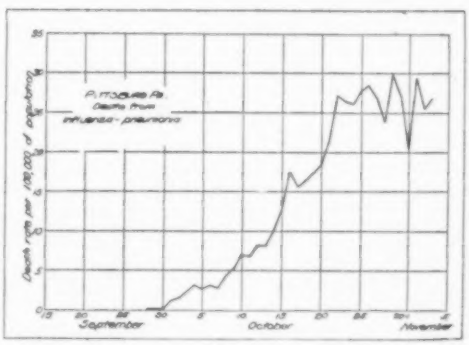
By The Editor.

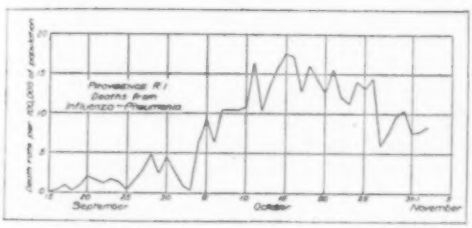
DEATHS FROM INFLUENZA AND PNEUMONIA PER 100,000 OF POPULATION.

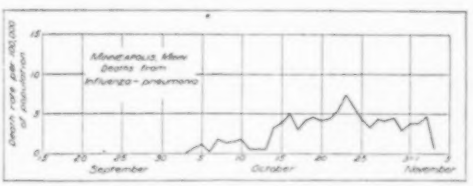


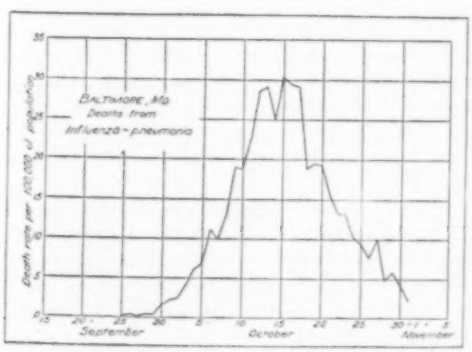


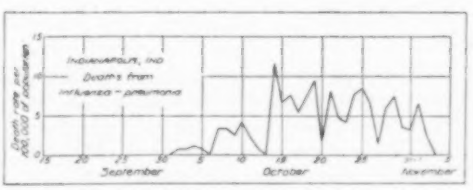


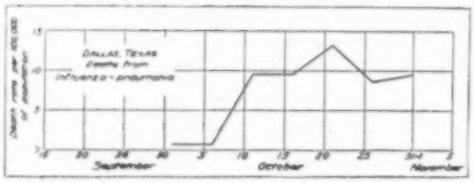


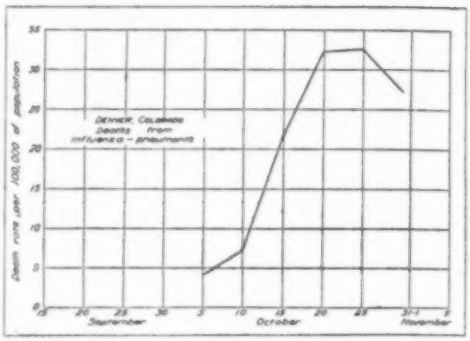


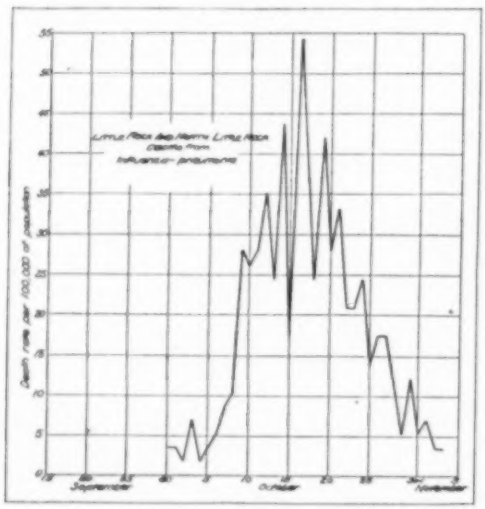


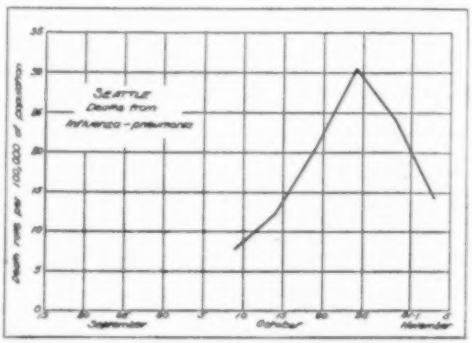


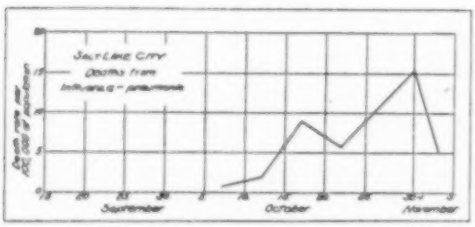


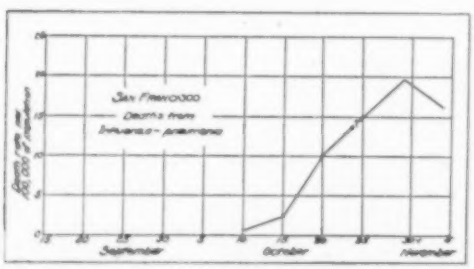












The foregoing charts were prepared under the supervision of Mr. John Ritchie, Jr., from data furnished to the editor through the courtesy of the health officers of the cities in question. The data for the far western cities were sent by telegraph, the deaths being stated for every fifth day, instead of for consecutive days, as were the cases in the more eastern cities.

In so far as possible, the reports were compared with the weekly reports of the U. S. Census Bureau. The deaths reported from Indianapolis were 15% and those from Minneapolis 30% lower than the Census Bureau reports, indicating that possibly the term "influenza-pneumonia" had not been interpreted as including deaths reported under both influenza and pneumonia. It was not possible so to check reports from the far western cities owing to the abridged character of the telegraphic reports. Reports from New York City, Boston and Providence checked well with the Census Bureau reports. Reports from Baltimore and Philadelphia were about 15% higher, possibly because of additional returns being recorded since reporting to the Census Bureau.

While the profiles are not closely comparable from the standpoint of death rates, it is believed that they will still be of value in indicating the relative periods of onset and decline, of present status, and of general courses of the respective local epidemics.—Editor.

INFLUENZA EPIDEMIC

City	Deaths from influenza during week ending [a]						
	September			October			
	14	21	28	5	12	19	26
Total	19	193	904	2718	6809	12303	13086
Albany					34	88	152
Atlanta					5	39	101
Baltimore				30	192	564	473
Birmingham	0	0	1	6	52	98	114
Boston	19	172	600	991	850	463	174
Buffalo				7	82	406	591
Cambridge			82	113	100	50	17
Chicago			17	171	571	1242	1541
Cincinnati				3	47	171	262
Cleveland				3	18	94	347
Columbus					15	45	117
Dayton					20	96	94
Denver					34	120	113
Fall River		4	14	86	192	169	87
Grand Rapids						5	7
Indianapolis					30	18	18
Jersey City				16	87		200
Kansas City, Mo.				26	75	113	118
Los Angeles					28	100	244
Louisville					15	26	24
Lowell			16	29	37	31	19
Memphis					13	30	39
Milwaukee					15	30	49
Minneapolis					37	89	128
Nashville					100	146	100
Newark		0	2	31	119	270	294
New Haven			11	30	68	130	154
New Orleans				12	95	447	449
New York		8	46	299	979	2218	2947
Oakland					7	21	111
Omaha					46	138	140
Philadelphia				399	1697	2953	1839
Pittsburg		0	1	12	12	228	119
Portland					0	16	
Providence				61	125	193	175
Richmond	0	1	1	21	89	139	151
Rochester					14	77	185
St. Louis					40	110	158
St. Paul					31	64	47
San Francisco						88	494
Seattle					54	85	153
Spokane					2	14	38
Syracuse			38	125	216	203	108
Toledo					2	29	
Washington, D. C			12	116	387	525	328
Worcester	0	8	63	131	177	122	67

a Blank spaces indicate that no report has been received.

This page is a reproduction of one of the weekly reports of the U. S. Census Bureau.

EDITORIAL SECTION

AMERICAN JOURNAL OF PUBLIC HEALTH
EDITORIAL OFFICE: 126 MASSACHUSETTS AVE., BOSTON, MASS.
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THE AFTERMATH OF THE EPIDEMIC.

During the week, ending October 26, 1918, 502 babies under one year of age died in the City of New York. According to Dr. S. Josephine Baker, Director of the Bureau of Child Hygiene, this is a larger number of infantile deaths than has occurred since the year 1910. In the corresponding week of 1917, there were only 221 deaths under one year of age.

During the week ending October 5, 1918, there were 200 deaths under one year of age, whereas in the corresponding week of 1917, there were 242 deaths. The influenza epidemic in the week of October 5 had not yet reached its maximum. The crude death-rate of this week was 16.3 as compared to 61.6 for the week of October 26.

Similar conditions have been noted in other cities. In Philadelphia, 269 infants under one year of age died during the week of October 26, as compared with 69 for the corresponding week of 1917. In Baltimore there were 127 deaths this year as compared with 28 deaths last year. Chicago showed 251 deaths this year as compared with 105 deaths last year. In practically all of the cities mentioned in the weekly report of the Bureau of the Census, the same conditions prevail. As the epidemic increased in intensity, there was a corresponding increase in infantile deaths.

It has been stated that the present epidemic differed from previous ones in the comparatively small percentage of deaths under fifteen years of age. There is no data available at present to determine whether the infants who have died were sufferers from influenza or pneumonia. It is quite probable, however, that many of them died of neglect owing to the illness of the mother or other member of the family. Statistics for succeeding weeks will probably show a continuation of these high infant death-rates, even after the epidemic is on the wane.

It is the irony of the situation that the year 1918 is "Children's Year." It was stated when the campaign of "Children's Year" began that it was hoped to save the lives of one hundred thousand babies. It is probable that 1918 will stand out as a year of high infant mortality.

What will happen after the epidemic is over? What will happen to the thousands of mothers who have had influenza and pneumonia and who are now convalescent? Will there be sequelæ as a result of the weakened condition in which many of these sufferers now find themselves? How many more babies will die as a result of improper

care and attention? How many more cases of tuberculosis will develop during the coming winter and spring as an aftermath of the epidemic?

What are health officers doing to meet this situation? In how many communities are campaigns of public health education being planned advising citizens to undergo periodic medical examinations? In how many cities will facilities be provided in the shape of dispensaries, clinics, etc., in which convalescents can receive advice, instruction and examination? Which health officers are looking forward to the possibility of a recurrence of the epidemic in the early spring or next year and are making plans accordingly? L. K. F.

INFLUENZA AND THE COMING ANNUAL MEETING.

The great epidemic has been a teacher as well as a destroyer. It is therefore planned to make influenza the most important subject of discussion at the annual meeting to be held at Chicago, December 9–12.

By that time, we shall be in a position to review the statistics of the epidemic: to trace the course of the disease from the East, through the European countries, and finally through our own land. We shall be able to say with reasonable accuracy what was the toll of the scourge as to deaths, and we shall be able to estimate the number of cases.

The discussion of research problems should be of the highest value: whether the causative organism is invariably *B. influenzæ;* the prevalence of the carrier condition; the value of vaccines of various types; the results with immune sera; and the value of the face mask.

The disease itself will be considered from the standpoint of symptoms, pathology and especially the complications and sequelæ, such as pneumonia. Experience in past epidemics has shown that we are by no means through with influenza, but must remain vigilant and active for several years at least.

The merits of the various types of treatment will be discussed in detail, and the most interesting results obtained with the open air hospitals will be presented.

Concerning administrative control a dozen questions immediately come to mind: What prophylactic measures have been found worth while? Does the stagger-hour transportation system help? At what point does it pay to close schools?

The saddest shortcoming revealed by the epidemic was the lack of a detailed plan for meeting exactly such a catastrophe: for mobilizing our medical, nursing, hospital, and relief forces upon the appearance of the first local outbreaks. We shall never be found in a similar predicament, for from the devastation of this epidemic will follow preparations against its repetition which will rival in thoroughness the most efficient planning of a great military offensive.

Now, as never before, the public has been aroused to the necessity of preventive medicine, universally applied. The American people, who furnished fifteen billions to fight the Hun, will readily see the wisdom of properly financing the fight against the enemy, disease, which in two months killed many times as many Americans as the German destroyed in a year.

Every health officer should come to the annual meeting prepared to take back to his community the lessons taught by the epidemic. It is hoped that members of the Association will take particular pains to bring with them to the meetings as many of their acquaintances as possible among the profession. A. W. H.

WHAT INDUSTRIES MAY WOMEN ENGAGE IN?

Women are capable of doing any and all kinds of work. It is not a question of women and industries but of the individual woman and the individual job. If the woman is properly selected through physical examination and is allowed to work under medical supervision and the occupation is conducted subject to the standards set for hygiene, sanitation, and accident prevention, women can do any sort of work which men can do.

The writer quite agrees with Mrs. Florence Kelly* that women in relation to work should not be considered in a mass, but there are certain groups of women and women at certain periods of life who are capable of applying themselves to work just as efficiently as men. Mosher and Martin† have concluded as a result of their investigation upon the physical powers of women that sex, as such, is not a disability. Dr. Mary A. S. Deacon,‡ after a medical supervision of about one thousand women in a munition plant in Great Britain, comes to the conclusion that even pregnancy is not to be considered a bar to employment, but in fact results in rather a better condition of health, where employment is allowed, subject to medical supervision.

Some women, otherwise able, should not be allowed to engage in any gainful occupation for social reasons such as the care and raising of a family, but if the average woman is given equal opportunity to acquire skill and experience and to adapt herself to her job, there seems no just reason for believing that if the job is not enhampered by various forms of health hazards, she may not do just as much as a man without detriment to her health.

As regards heavy work, it is to be noted that women are about nine-tenths the equal of men as to red blood corpuscles, that their bony skeleton is rather slighter, height to height and weight to weight, and that they may not have quite an equal reach. Even these features may be but the result of a lack of opportunity to use their bodies in ways similar to men. It may come as a blessing to men that permission is given women to work in certain industries, upon the condition that certain health and accident hazards are to be removed. It may humanize industries more. This should not be taken as an argument that men can stand things which women cannot. Men cannot and do not stand them. E. R. H.

THE INFLUENZA PAPERS IN THIS ISSUE.

With the enormous interests in the pandemic of influenza, the JOURNAL again presents in this issue a number of papers upon the subject. All of these have been prepared in relatively short time and are, therefore, not as complete as they might be were not prompt publication so desirable.

We have first two papers dealing with studies made in Chicago. We have also reproduced one of the emergency reports prepared by the United States Census Bureau. The Bureau deserves great credit for the promptness with which the Weekly Mortality Reports and special reports are manifolded and distributed.

Finally, believing that a brief graphic presentation of the situation might be of value, the JOURNAL presents profile charts based upon death reports from fourteen large cities in various parts of the country. To the departments which furnished this information, the thanks of the Association are due for promptness and courtesy with which the returns have been made. The more distant cities have replied by telegraph and in these cases the curves are based upon five-day intervals rather than upon daily intervals.

Only fourteen cities are represented on the charts although twenty-one departments sent in returns. It was necessary to restrict the number of charts in order not to delay publication unduly.

A résumé of the statistics furnished is given in Table I herewith.

Owing to the limited time available it is felt best to leave the drawing of conclusions to the reader rather than to make any observations which would necessarily have to be based upon a very cursory examination.

The curves are all drawn on the same scale per hundred thousand population and are, therefore, comparable with one another from this standpoint. However, it is well to bear in mind that in the time of an influenza epidemic many deaths will be reported as due to this disease which should have been assigned to another cause. A more reliable index would have been the charting of the excess of the total death-rate over the rate for the corresponding period for the last five years.

*Problem of the Married Woman in Industry. Bull. Penn. State Dept. of Labor and Ind., Vol. V, No. 1, 1918.
†The Muscular Strength of College Women. Jour. Amer. Med. Assoc., Vol. 70, No. 3, Jan. 19, 1918.
‡Thoughts on Employment of Pregnant Women in Munition Factories. The Lancet, London, Sept. 7, 1918.

TABLE I.

City	Approximate Dates		Statistics per 100,000 of Population to Nov. 3.	
	First Cases	Peak of Deaths	Reported Case-Rate	Total Death-Rate
		October		
Boston		2		563
Providence		15		381
New York	Sept. 12	22	2,180	311
Philadelphia		15		708
Baltimore	" 23	15	3,486	447
Washington	" 21	12	7,047	517
Norfolk	" 20	13	9,500	332
Dallas		21	6,770	244
Buffalo	" 1	19	5, 73	437
Pittsburg	Oct. 1	29	3,000	533
Wheeling	" 4	22	1,184	106
Indianapolis	Sept. 28	19	2,270	130
Milwaukee	" 26	22	1,995	82
Minneapolis	" 27	23	2,510	99
Chicago	" 19	17	1,412	311
Des Moines	Oct. 1	17	2,000	61
Little Rock	Sept. 16	16	1,724	636
Denver		18	1,644	147
Salt Lake City		31	2,587	170
Seattle		24	3,018	122
San Francisco		31	4,816	338

A further discrepancy probably arises from varying methods in reporting influenza deaths due from certain joint causes, such as tuberculosis, Bright's disease, etc.

A. W. H.

PROGRAM CHANGES FOR THE ANNUAL MEETING.

In so far as possible it is planned to follow the same relative arrangement of sessions as was announced in the September issue of the JOURNAL. For example, the papers originally scheduled on a Monday will be held on the Monday session in December. One exception, however can be announced at this time: the Laboratory Section meetings which were to have begun on Tuesday will begin on Monday afternoon, December 9. It follows that all of the sections with the exception of Sanitary Engineering will have their first meetings on Monday afternoon, December 9, at 2.00 p. m. The Sanitary Engineering Section will have its first meeting on Wednesday morning, December 11.

A number of new papers have been added to the section programs. The Laboratory Vital Statistics and Sociological Sections will have a number of papers on influenza. Since, however, all of the additions cannot be given at this time, it is thought best to reserve these for the final program.

As has been repeatedly stated elsewhere in the JOURNAL, emphasis will be placed in the programs of the general sessions upon two new subjects: influenza and post-war health problems.

◈

The National Association for Public Health Nursing will have Special Meetings in Chicago following the A. P. H. A. Sessio 1s. The Meetings will be held on Thursday Evening, December 13. Headquarters, Hotel Morrison. For further information, address the Secretary at 156 Fifth Avenue, New York City.

A SIMPLIFIED FUCHSIN SULPHITE (ENDO) AGAR.

MAX LEVINE,

From the Laboratories of the Engineering Experiment Station and Department of Bacteriology, Iowa State College, Ames, Iowa.

THE Endo medium has been used for many years for the isolation of *B. typhosus* and members of the intermediate group. Recently it has been finding considerable favor as a confirmatory test for *B. coli* in positive presumptive tests in water analysis. The medium has given very variable results in the hands of different observers and consequently many modifications for its preparation have been proposed. Considerable emphasis has been put, in the past, on the necessity of a proper reaction and explicit details are usually given for the careful adjustment of the reaction by the addition of sodium carbonate or other alkali.

It has been quite firmly established by work of Clark and his associates of United States Department of Agriculture, that adjustment of the reaction, as ordinarily carried out in preparation of bacteriological cultural media, using phenolphtalein as an indicator, is quite unreliable as it yields relatively little information as to the true acidity of the complex medium. It seems that it would be far preferable to employ a medium in which the reaction is automatically adjusted and that such a medium would very likely give more concordant result in the hands of different investigators. It appears also that the media ordinarily employed is much more complex than is necessary for a rapid growth of the colon typhoid group.

With pure cultures of *B. coli*, *B. aërogenes*, *B. typhosus*, *B. para typhosus A and B*, *B. enteritidis* and *B. cholera suis* excellent growth and differentiation has been obtained on a medium of the following composition:

Distilled water	1000 grams
Dipotassium phosphate	2 to 5 grams
Agar	15 to 30 grams

The ingredients are boiled until dissolved and any loss due to evaporation is made up with distilled water. The agar is then flasked, placing definite quantities in each flask, and sterilized for 15 minutes at 15 lbs.

No adjustment of reaction is made. Filtration of medium is not necessary when used for plate cultures, which are inoculated on the surface.

Just prior to use, the following materials are added to each 100 cc. of melted agar:

1 gram or preferably 5 cc. of 20 per cent lactose solution

½ cc. of a 10 per cent alcoholic solution of basic fuchsin

2½ cc. of a freshly prepared 10 per cent solution of sodium sulphite, which has been heated for a few minutes in the Arnold, or brought to a boil over the flame.

Plates are poured, allowed to harden in incubator, and inoculated in the ordinary way.

The members of the intermediate and typhoid group grow very well upon this medium. Some colonies are often about 3 mm. in diameter in 24 hours. The colonies are transparent and colorless, or they may show a very faint yellowish or amber tint.

The colonies of *B. coli* and *B. aërogenes* are larger than those of the typhoid and the intermediate group. *B. coli* forms deep red button-like colonies, which have a greenish metallic sheen when viewed by

reflected light. They are usually 4 millimeters or more in diameter when well isolated. The *B. aërogenes* group do not show the metallic luster. They are lighter colored. They are usually considerably larger than those of *B. coli* and markedly convex.

If the concentration of dipotassium phosphate is one-half per cent, differentiation between *B. coli* and *B. aërogenes* is very marked, but some strains of *B. coli* do not develop the highly colored reaction for 36 hours, which tends to obscure the differentiation between these two types. If the concentration of the phosphate is reduced to 0.2 per cent, the medium colors more rapidly on exposure to light and although the distinct reaction of *B. coli* is hastened, many of *B. aërogenes* strains may develop a metallic luster which is undesirable in attempting to employ this medium for differentiation of *B. coli* from *B. aërogenes*. For isolation of typhoid and para typhoid it is felt that 0.2 per cent K_2HPO_4 is preferable.

The work with this medium in this laboratory has been practically confined to pure cultures. In a few instances the simplified fuchsin sulphite (Endo) agar was employed to confirm positive presumptive tests for *B. coli* with very excellent results.

If this medium works out as well with routine samples as it has with pure cultures it may well be substituted for the standard Endo because of the ease and rapidity of preparation and simplicity of its ingredients.

◈

INFANT MORTALITY ASSOCIATION MEETS WITH A. P. H. A.

The American Association for the Study and Prevention of Infant Mortality will meet at the Congress Hotel, Chicago, December 5-7. There will be a Joint Session with the American Public Health Association on Saturday Afternoon, December 7 at 2 o'clock, at Congress Hotel. The Program will be a Symposium on Rural Health Administration.

For Programs, etc., write to the Executive Secretary, A. A. S. P. I. M., 1211 Cathedral Street, Baltimore, Maryland.

◈

"JUST THE SAME AS ALL THE REST, IT IS TABLE D'HOTE FROM NOW ON"
THE ALLIED RESTAURANT
"WHAT CAN I HAVE THAT'S SPECIAL?"
THE FRENCH PEOPLE
THE ENGLISH PEOPLE
THE AMERICAN PEOPLE
THE ITALIAN PEOPLE
THE BELGIAN PEOPLE
U.S. FOOD ADMINISTRATION

In Memoriam.

DR. F. F. WESBROOK.

Another of our presidents has been added to the list of those whose labors in Science and Public Health are ended, in the death of Dr. F. F. Wesbrook, President of the University of British Columbia, who died at Vancouver on October 20, 1918.

He was born in Brant County, Ontario, in 1868 and spent his youth in the vigorous surroundings of a new prairie community in the rapidly growing city of Winnipeg.

Graduating from Manitoba University in 1887, Doctor Wesbrook studied medicine in Winnipeg and McGill and later spent several years in the laboratories of the University of Cambridge, returning to Canada as one of the best equipped students of his time in the field of biology, to which most of his later life-work has been given.

His most extended work was done in connection with the State Board of Health of Minnesota and in Minnesota University. As first state biologist his studies were especially applied to the contagious diseases of men and animals; while amongst his most notable studies was that in 1899 on the variable morphology of the *Bacillus diphtheriæ* with which seemed associated definite differences in virulence. When later Professor Wesbrook became the head of the biological department in the University Medical School and still later Dean of the Faculty, his splendid executive qualities were given a full opportunity for their exercise. Endowed with ample funds through the university lands, this medical school rapidly took its place as one of the most modern in equipment and methods, pervaded in an unusual degree with the most advanced teachings of biology in relation to medicine.

Strong in his attachment to the land of his birth and in enthusiasm for constructive educational work, Professor Wesbrook gladly accepted the task of going to the young Province of British Columbia to organize what is to be the great university of the Pacific coast of Canada.

During the many years of Doctor Wesbrook's association with the Minnesota Department of Health, he was one of the most active members of the American Public Health Association. Not only did he present many papers to the Section of Bacteriology and Chemistry, but also read others of a more general character. In his annual address as President in 1905 at Boston, on "Coördinated Specialism in Public Health Work," he forecast changes which the Association must make to meet the rapidly broadening outlook of public health work.

In his death the Association loses one of its most cultivated and useful members; science and education will be poorer for his too early demise and his friends will long miss the cheery smile and kindly friendship of one who was always ready to assist in anything which aimed to increase the happiness of humanity. With them we say *Addio amico!*

—Peter H. Bryce, M. D.

DOCTOR C. S. CAVERLY.

On October 16, Dr. Charles Solomon Caverly died at his home in Rutland, Vt. of complications following influenza. Doctor Caverly had been a member of the Association since 1894, and at the time of his death was a member of the Board of Directors. He had been associated with the Vermont State Board of Health as President, since 1891.

Doctor Caverly was born in 1856 at Portsmouth, N. H., and was educated in the same state. His medical education was received at the University of Vermont, and at the College of Physicians and Surgeons at New York. He soon became associated with public health activities, and remained an active worker to the time of his death. In both poliomyelitis and tuberculosis he became an authority. In 1894, he published in the *New York Medical Record* (December 1, 1894), the original report of the first extensive epidemic of poliomyelitis reported to the medical profession in this country. More recently, he has been associated in this same work with Flexner, Amoss, Lovett, and others. At the University of Vermont, he was Professor of Hygiene.

He was a kindly man, and an energetic and public-spirited worker. His departure will be mourned by many.

ASSOCIATION NEWS

By the Secretary, A. W. Hedrich.

REPORT UPON AN AUDIT OF THE BOOKS AND ACCOUNTS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION FOR THE YEAR ENDED AUGUST 31, 1918.

October 7, 1918.

American Public Health Association,
126 Massachusetts Avenue, Boston.

Gentlemen: In accordance with your instructions we have made an audit of the books and accounts of your Association for the year ended August 31, 1918.

We present the results of our examination in the following exhibits:

Exhibit A—Comparative Balance-Sheet as of the Close of Business August 31, 1917 and 1918.

Exhibit B—Comparative Statement of Income and Outgo.

Treasurer's Cash, $2,226.46:

We have verified the balance of the treasurer's account as shown by the ledger with the bank statement and have found same to be correct. We have footed and cross-footed the total of cash receipts by months and have traced all receipts to bank. All checks drawn by the treasurer had proper authorizations for payment, signed by your president and secretary.

Secretary's Cash, $276.31:

The secretary's cash account as shown by the ledger was found to be in balance with the bank statement. We have traced all cancelled checks drawn by the secretary in payment of current expenses through the cash book, footed and cross-footed the disbursements for each month. All checks drawn by the treasurer to the Association to reimburse the secretary's fund have been properly accounted for in the secretary's accounts.

Petty Cash, $25.00:

We have checked all vouchers to the petty cash and have verified footings of same. Cash on hand has been counted amounting to $15.24, and vouchers for expenditures amounting to $9.76 were accounted for.

Inventory, $1,836.40:

The inventory as shown in balance-sheet consists of a supply of paper amounting to $1,686.40 which was bought from the Rumford Press and is held by them, and $150.00 which is an estimated figure of bound volumes, supplies, stationery, and Association badges. This amount, in our opinion, is conservative as there are about one hundred badges valued at $1.00 a piece on hand.

Office Equipment, $966.35:

This amount as shown on the ledger amounts to $1,186.27 less 10 per cent depreciation which has been charged off for the past two years amounting to $219.92.

Exhibit A.

It will be noted that as in our previous reports no dues or advertising accounts receivable are carried as assets. This is in accord with the policy established some time ago. We are informed, however, by your bookkeeper that on August 31, 1918, there were receivables from dues of approximately $3,500.00 to $4,000.00.

On our last report the Association owed the Rumford Press $1,645.10 for printing. This liability has been paid and current bills to date are also paid.

Exhibit B.

The deficit a year ago was $106.75 and now shows a profit of $5,330.52. The operating income has increased 47 per cent, while the outgo has decreased .5 per cent. The large increase in operating income is due mainly to the increase in corporate memberships which this year amount to $4,340.00.

We note that in the previous year dues from corporate members amounting to $300.00 were credited to individual dues account, while this year a change has been made in your method of accounting and a new account opened for "corporate and sustaining members" to which such receipts are now credited.

You will notice that there has been a large decrease in your Journal subscriptions and an increase of individual dues. This is also due to a change in the method of bookkeeping. Formerly on receipt of five dollars from a member two dollars was credited to Journal subscriptions and three dollars to individual dues. Now the five dollars received from a member is credited direct to individual dues.

Other Comments.

We suggest that a record of receipts by the secretary from the treasurer be made in the secretary's cash book and that the bookkeeper strike a balance at the end of each month showing cash balance on hand, in agreement with her ledger account.

We have found that the accounts had been carefully kept and that the bookkeeping work on the whole has been good.

Very respectfully,
Harvey S. Chase & Company,
Certified Public Accountants.

AMERICAN PUBLIC HEALTH ASSOCIATION.

Comparative Balance-Sheet.

August 31, 1917 and 1918.

Assets.	*August 31, 1917.*		*August 31, 1918.*		*Liabilities.*	*August 31, 1917.*		*August 31, 1918.*	
Cash:					Due Rumford Press	$86.04			
Treasurer's Account		$146.59		$2,226.46					
Secretary's Account		227.10		276.31					
Petty Cash		25.00		25.00					
Total Cash		$398.69		$2,527.77					
					Notes, Payable	1,559.06			
Inventory:									
Salable Stock on Hand		150.00		1,836.40					
Office Equipment	$1,099.62		$1,186.27						
Less Reserve for Depreciation	109.96	989.66	219.92	966.35					
Total Assets		$1,538.35		$5,330.52					
Deficit, September 1, 1916	$1,789.99								
Adjustment, Rumford Press Account	54.47								
	$1,844.46				Net Profits for Year		$5,437.27		
Deduct Gain, 1916–17	1,737.71	106.75			Less Deficit, 1917		106.75		5,330.52
		$1,645.10		$5,330.52		$1,654.10		$5,330.52	

Note our remarks in the text concerning accounts receivable.

AMERICAN PUBLIC HEALTH ASSOCIATION.

Comparative Statement of Income and Outgo.

For the Years ended August 31, 1915, 1916, 1917, and 1918.

	1915.	*1916.*	*1917.*	*1918.*
Income.				
Journal Subscriptions	$4,682.35	$5,104.60	$5,586.73	$2,352.18
Dues, Individual	3,625.00	4,617.53	4,903.04	8,073.57
Corporate and Sustaining Members				4,340.00
Journal Advertising	2,230.44	2,327.53	2,263.83	4,296.73
Sales of Water Reports	782.73	890.10	1,500.65	1,995.28
Sales of Journal Copies	308.87	448.00	327.54	187.70
Sales of Milk and Air Reports	43.45	9.00	144.87	77.65
Sales of Transactions	38.00	11.50		
Sales of Bound Volumes	24.70	46.45	13.38	121.45
Miscellaneous Income	66.04	176.27	99.85	173.49
Sales of Badges		147.00	85.00	48.40
Miscellaneous Sales Account				132.86
Annual Meeting Exhibits				152.50
	$11,801.58	$13,777.98	$14,924.89	$21,951.81
Outgo.				
Journal Printing and Mailing	$5,185.80	$5,577.81	$6,337.22	$5,593.79
Salaries	3,868.52	2,752.58	2,737.92	1,999.92
Office Payroll	2,034.51	2,442.90	2,450.45	3,578.38
Convention Expenses	1,100.71	338.65	661.73	537.79
Depreciation of Office Furniture and Fixtures			109.96	109.96
Postage	1,063.15	736.74	1,184.92	1,188.40
General Expense	682.39	681.58	732.93	1,049.86
Rent	544.61	626.44	449.98	300.60
Stationery and Supplies	1,346.37	764.63	735.61	605.46
Travelling	190.88	43.90	95.20	274.18
Discounts	84.49	91.25	58.25	24.36
Commissions	68.60	148.45	219.76	179.00
Interest	42.01		31.18	31.36
Refunds	33.71	59.38		
Cost of Pamphlets Sold	170.14	288.28	994.35	1,191.23
Cost of Badges Sold		94.86	64.72	33.60
Annual Meeting Exhibits				61.15
Bank Exchange				10.50
Profit and Loss				5.60
	$16,415.80	$14,647.45	$16,864.18	$16,774.54
Operating Loss	$4,614.31	$869.47	$1,939.29	
Operating Gain				$5,177.27
Add Donations	1,785.00	900.00	3,677.00	260.00
Net Loss	$2,829.31			
Net Gain		$30.53	$1,737.71	$5,437.27

HELP WANTED.

In order to help relieve the shortage of sanitarians due to the war, free help-wanted announcements will be carried in this column until further notice. Copy goes to the printer on the first of each month. In answering keyed advertisements, please mail replies separately.

The Health Employment Bureau also sends lists of applicants to prospective employers without charge.

State Epidemiologist wanted in West Virginia. Address No. 178, J. L. S., care of this Journal.

Graduate sanitary engineer with experience in operation of rapid sand filter plants. State salary expected. Address No. 176, D. E. S., care of this Journal.

White graduate nurse with public health training for city work. Salary, $1,000 to $1,200 per annum. Send references and experience to Dr. I. M. Cashell, Health Officer, Goldsboro, N. C.

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National Supervision of Industrial Hygiene and Medicine.—The Office of Industrial Hygiene and Medicine of the U. S. P. H. S. will investigate conditions and institute means whereby lost time and inefficiency caused by impaired health of workers may be cut to a minimum. A large corps of men fitted for industrial service is needed to carry on this work effectively, and the office is seeking the assistance of experienced industrial physicians, hygienists, sanitarians, chemists and technically trained engineers with practical experience in safety work, ventilating, illuminating and production.

The Senate Joint Resolution No. 63, recently passed by Congress, authorizes the granting of commissions in the service of this Division to such men as may qualify. The Division is in urgent need of personnel. Applications for commissions will be received at the office of this Division, Room 202, Ouray Building, Washington, D. C.

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The following were elected to membership in the Association during October, 1918:

F. A. Anderson, Minneapolis, Minn., Social Service Director, Street Ry. Co.

Benjamin Levin, Pittsburgh, Pa., Bacteriologist.

R. Mitchell Strother, Lynchburg, Va., Employment Manager, Craddock-Terry Co.

W. Lewis Howe, M. D., Everett, Mass., Physician, Chairman Health Dept.

Frank Woodbury Jones, B. S., Albany, N. Y., Assistant Engineer, N. Y. State Health Dept.

Oscar Millson Craven, M. D., Cincinnati, Ohio, Chief Medical Inspector, Dept. of Health.

Ernest Zueblin, M. D., Cincinnati, Ohio, Resident Medical Director.

Edgar L. Vermilya, M. D., Fremont, Ohio.

Robert M. Calfee, Cleveland, Ohio, Member Public Health Council.

Lucy Burton Buell, Painesville, Ohio.

Helena R. Stewart, Ph. B., R. N., State Dept. of Health, Columbus, Ohio., Director Public Health Nursing Service.

John R. Murlin, A. M., Ph. D., D. Sc., Rochester, N. Y., Professor of Psychiology, Director of Dept. of Vital Economics.

Julius Spiro, M. D., Chicago, Ill., Physician.

Martin Schupmann, M. D., Chicago, Ill., Physician, Health Officer.

William P. Schoen, A. M., M. D., Chicago, Ill., Physician.

William J. Pollock, B. S., M. D., Chicago, Ill., Physician and Surgeon.

Alfred L. Buck, M. D., Chicago, Ill., Physician and Surgeon, Food Inspector, Chicago Health Dept.

Hugh James Polkey, M. D., Sc. B., Chicago, Ill., Physician.

Alvah John McCarter, M. D., Chicago, Ill., Physician, Medical Inspector.

Michael J. McKenna, M. D., Chicago, Ill., Physician.

Louis Maywit, Ph.D., M. D., Chicago, Ill., General Practitioner and Field Health Officer, Health Dept.

Jeannette Franc Throckmorton, Ph. B., A. M., M. D., Chariton, Iowa, Physician.

Elizabeth B. Morrill, Ph.G., B. Sc., M. D., Chicago, Ill., Physician and Surgeon.

Morris L. Weinstein, Chicago, Ill., Physician.

Frank H. Stevenson, B. A., M. D., Chicago, Ill., Physician.

Petra M. Dahl, B. S., A. B., M. D., Chicago, Ill., Physician and Surgeon.

Walter Waldo Armstrong, M. D., Chicago, Ill., Supervising Field Health Officer, Chicago.

Milton Frederick Stein, B. S., C. E., Chicago Ill., Sanitary Engineer.

Rosina Rehor Wistein, M. D., Cedar Rapids, Iowa, Physician and Surgeon.

Mayor James Saul, Dubuque, Iowa, Local Board of Health.

Will C. McIrvin, M. D., Atwood, Kans.

Russell J. Smith, M. D., Pocatello, Idaho, Part-Time Health Officer.

George Allen Love, M. D., Preston, Minn., Village and County Health Officer.

Olive E. Beason, R. N., Akron, Ohio, Director Division of Public Health Nursing.

Samuel G. Paul, M. D., Salt Lake City, Utah, Physician, Part-time.

A. M. Harvey, M. D., Chicago, Ill., Physician, Crance Co.

Willard E. Ward, Brookline, Mass., Agent for Milk and Food Sanitation.

W. O. Nance, M. D., Physician, Chicago, Ill.

E. R. Pritchard, Chicago, Ill., Secretary Health Dept.

Charles L. Tinker, M. D., New Philadelphia, Ohio, Health Officer.

W. D. Pennington, M. D., Chicago, Ill., Physician.

Helen Letitia Palliser, A. B., A. M., M. D., Poughkeepsie, N. Y., Physician.

Treston R. Ayars, M. D., St. Louis, Mo., Sanitary Inspector, Camp Custer, Mich.

Leslie E. Coffin, M. D., Iron Mountain, Mich., Physician, Part-time Health Officer.

W. J. Taylor, M. D., Port Angeles, Wash., Part-time Health Officer.

Cecil Kent Drinker, M. D., Boston, Mass., Assistant Professor of Physiology, Harvard Medical School.

Harry R. Cliff, M. D., Portland, Ore., County Physician, Acting A. Surgeon, U. S. Health Bureau.

James P. Faulkner, A. M., Atlanta, Ga., Executive Secretary Ravul Foundation, Director Div. of Tuberculosis State Board of Health.

Ethel R. Hawley, Oklahoma City, Okla., Assistant Registrar of Vital Statistics, Health Dept.

Wm. Harry Cunningham, M. D., Rockford, Ill., Commissioner of Health.

Wm. Albert Mudge, M. D., Negaunee, Mich. Health Officer.

Royal B. Dobbins, M. D., Youngstown, Ohio, Acting Chief Surgeon.

Geo. U. Simpson, M. D., Warren, Ohio, Physician.

Mrs. K. R. J. Edholm, Omaha, Nebr., Executive Secretary, Nebr. Ass'n for the Study and Prevention of Tuberculosis.

Joseph J. Craven, A. B., M. D., C. P. H., Jersey City, N. J., Health Officer.

Geo. Clinton, M. D., D. O. H., Belleville, Ont., District Health Officer.

Walter McNab Miller, M. D., Columbia, Mo., Secretary, Missouri Ass'n for the Relief and Control of Tuberculosis.

Guy E. Shoemaker, Freedom, Pa., Plumbing.

Le Roy Lang, Jacksonville, Fla., Dairy Products Technologist.

John M. Kennedy, Jr., Denver, Colo., Executive Secretary, Colo. Public Health Ass'n.

R. Barclay Spicer, Philadelphia, Pa., Executive Secretary, Penn. Soc. Prev. of Tuberculosis.

George Eaves, D. D., Birmingham, Ala., Secretary Ala. Anti-Tuberculosis League.

David E. Sloan, M. D., Charleroi, Pa., Industrial Physician and Surgeon.

Carrie B. Levy, Milwaukee, Wis., Supervisor, Special Classes School Bd.

Robert B. Kerr, M. D., Manchester, N. H., Physician, Executive Secretary, N. H. Asso'n Prev. of Tuberculosis.

H. M. Bascom, M. D., Peoria, Wis., Chief Surgeon, Ill. Traction System.

Ruth McNary Smith, B. S., Ames, Iowa, Associate Professor Home Economics, Iowa State College.

Charles O. Probst, M. D., Columbus, Ohio.

Francis J. Bean, A. B., Mercersburg, Pa., Instructor in Biology.

William J. Orchard, S. B., New York City, Sanitary Engineer.

Margaret K. Preston, B. S., Utica, N. Y., Bacteriologist.

Morris Dworski, Loomis, N. Y., Laboratory Assistant, Babbit Memorial Laboratory, Loomis Sanatorium.

Isador William Mendelsohn, Worcester, Mass., Assistant Sanitary Engineer.

J. W. Armstrong, Winnipeg, Manitoba, Municipal Commissioner.

Raymond F. Wright, M. D., Chicago, Ill., Physician and Surgeon, Supervising Medical Inspector.

G. M. Cushing, M. D., Chicago, Ill., Sup. Health Officer.

Aaron Grant Fairfax, A. B., M. D., Chicago, Ill., Physician and Surgeon.

Burr A. Robinson, B. S., New Haven, Conn., Industrial Relations Manager Footwear Div., U. S. Rubber Co.

Roy F. Woodbury, Montgomery, Ala., U. S. Public Health Service.

To those members, through whose courtesy these new members were introduced, the American Public Health Association extends its sincerest thanks.

STORIES FROM THE DAY'S WORK

Our readers are invited to contribute to this section.—*Editor.*

A SOLUTION FOR THE "NUISANCE" BUGABOO.

One of the things which most annoys the health officer is the tendency of the public to blame him for conditions over which he has no control. Complaints come in about the streets, sewers, dead animals, plumbing, and other things which are handled by other departments. If the health officer refers the complainant to the proper department, he is accused of incompetence, laziness, "buck-passing" and the like.

Under the new City Manager charter in San José, Cal., this form of annoyance was successfully handled by establishing a central complaint and inquiry bureau in the City Manager's office. Complaints received here were immediately recorded on a special form, and referred to the proper department, and a return report demanded promptly; the return report was then communicated to the complainant, and the matter settled. A notice in regard to the bureau was published frequently in the local papers.

When the Health Department received directly a complaint within its jurisdiction, it was recorded at once on a special form, referred to the proper inspector, and handled promptly. But when a complaint outside its jurisdiction was received, the complainant was referred to the City Manager's complaint bureau; if there was objection, complainant's attention was called to the published notices in regard to the bureau, which usually settled the question. And as the telephone hung up, you could usually hear the department clerk heave a sigh of relief and bless the City Manager form of government.

HAROLD GRAY.

EMULATING TYPHOID MARY.

An interesting experience with a typhoid carrier was brought to a climax in this state last month.

Early in 1916, several cases of typhoid appeared in the town of S—, population, 12,000. Three cases were found to be securing milk from Mrs. H. B. who kept one cow for family use and sold the residue. Mrs. B. gave no history of having had typhoid fever.

She gave a positive Widal in June, 1916, and was ordered by the local health officer to discontinue the sale of milk. This order was ignored and in a second series of cases, appearing in October, the milk was again traced to this source and an order to discontinue selling milk was issued to this woman by the State Board. Mrs. B. then disposed of her cow. Last Christmas (1917) she bought a new cow and in the spring again began to sell milk occasionally. A family newly arrived in town took milk from this dairy early in the summer. Two cases of typhoid appeared in this family. The State Board of Health filed a complaint and the defendant was found guilty. The sentence of ten days' imprisonment was suspended so long as the defendant refrained from selling milk.

LESTER FEEZER.

AN EXPERIENCE WITH ANTHRAX.

Mr. Blank thought his cow looked sick; he noted she was not keen to eat, but before he could do anything the poor thing died. Hides are valuable, why not skin her! Mr. G. was asked to assist; he said "nothing doing," but a young boy on the place was induced to help. In five days Mr. Blank was dead.

While the skinning was in progress, the young fellow who helped was cut on the hand. Soon he became alarmingly ill. The doctor was called and wired the State Board of Health that this was probably a case of human anthrax. The State Board in turn directed the parish health officer to visit the neighborhood and investigate. As soon as he arrived, the parish health officer telegraphed back to the State Office "please send a man to control situation."

A representative from the Louisiana State Board of Health arrived about nine o'clock at night. Nobody wanted to go to the home where the patient was dying or dead; in fact, nobody would go. The doctor learned that one of the physicians of the community was at the home of the dying man and that the neighbors were very greatly excited. Finally the Board of Health physician induced a negro boy to take him "down the road a piece." The directions had been "walk the big road three miles and then go through the woods a half mile." After about ten minutes on the "big road" the boy turned into the woods. "Why, we haven't walked three miles!" "No sah, hits near to two miles and a half in de woods." "Won't you go with me?" "No *sah!*" "Well, won't you go with me until we are about half a mile from the house? I fear I cannot find it." At last the boy was persuaded; but he left the doctor in the woods.

When the physician reached the house he found the poor boy had died and had been buried by his mother and the doctor; no one else would go near.

Members of the families of the patients and some of the neighbors had gathered at the home of one of the patients. Some were praying, some weeping, all

hysterical. There were two men sick. One had nursed Mr. Blank, and had been bitten by a mosquito on the arm and had caught the infection from rubbing the mosquito bite with his infected hand. The pustule was typical. The patient developed constitutional symptoms and was very sick.

Another young man, who had nursed the dead boy, had on the back of his hand a sore place, which according to information given, was a pustule also. When this appeared the young man poured carbolic acid over the entire back of his hand. It was a horrible sight, the flesh being literally cooked. Notwithstanding this mistaken heroic treatment, he later developed constitutional symptoms.

Being a practical man, the doctor took off his coat, made himself a cob pipe and sat on the gallery all night, one of the group. He did what was possible to quiet them and wired for serum. Later when the serum arrived, the hardest part of his work was to convince the patients and their relatives that it was not dangerous. Fortunately for the reputation of serum in that locality it worked wonders.

Oscar Dowling, M. D.,
Agnes Morris.

BOOKS AND REPORTS REVIEWED

BOOKS FOR NURSES.

No. I. Hygiene for Nurses. *Nolie Mumey, M. D., Little Rock, Arkansas. The C. V. Mosby Company, St. Louis. Pp.* 160. *Price,* $1.25.

This little elementary book takes up the subject in a way so that the nurse can get ready information without reading voluminous material. The author discusses in simple and clear language eugenics; hygiene of pregnancy, infancy and puberty; the causes and transmission of disease; diseases; immunity; food; water; air; ventilation and disinfection. A total of seventy-one well selected illustrations adds materially to the interest. It may have been well to touch upon the rudiments of vital statistics and to emphasize the importance of personal hygiene which after all is the foundation of preventive medicine.

No. II. A Textbook of Physiology for Nurses. *William Gay Christian, M. D., and Charles C. Haskell, Medical College of Virginia. The C. V. Mosby Company, St. Louis. Pp.* 168. *Price,* $1.75.

The subject is well discussed in thirteen chapters. The illustrations, of which there are thirty-four, were carefully chosen. The writer assumes a certain knowledge of anatomy, physics and chemistry on the part of the nurse. An "Appendix" serves to refresh the memory with some basic elements of physics and chemistry. This little book can be warmly recommended for student nurses. It contains in a brief space as much material as the average nurse would ever require for purposes of study or reference.

No. III. Surgical and War Nursing. *A. H. Barkley, M. D. (Hon.), M. C., F. A. C. S., Lexington, Ky. The C. V. Mosby Company, St. Louis. Pp.* 208. *Price,* $1.75.

This is a timely little book and one that cannot fail to appeal to the nursing profession. Much of the matter discussed deals, of course, with everyday hospital technic but particular stress is laid upon the problems which the nurse is bound to face in connection with wartime activities. Four chapters out of a total of twenty-three are devoted exclusively to "War Nursing." The book is richly illustrated. It represents a practical and valuable contribution to the modern nurse's library.

No. IV. Nursing in Diseases of Children. *Carl G. Leo-Wolf, M. D., University of Buffalo, N. Y. The C. V. Mosby Company, St. Louis. Pp.* 314. *Price,* $2.50.

This book is presented to the profession as a textbook for nurses and all reference to points of diagnosis and treatment have therefore been omitted. Included are chapters on "Public Health Nursing," by Mrs. A. L. Hansen, R. N.; on "The Clothing of the Baby," by M. J. Robertson, R. N.; and on "Mental Hygiene," by H. G. Matzinger, M. D. Even though the book is primarily intended for nurses it contains much which ought to be of value to the medical student who is fed upon theory and to the young physician who very often finds in his early experience with children's diseases that the attending nurse knows more about the practical application of everything pertaining to the comfort of the little patient than he does. The book is written in clear style. The author's wide personal experience on this subject gives it a personal flavor in which respect it differs from many similar publications. The text is accompanied by a goodly number of charts and illustrations.

Arthur Lederer, M. D.

PUBLIC HEALTH NOTES

Abstracted by DAVID GREENBERG and M. P. HOROWITZ.

The Health of Food Handlers.—As a result of a coöperative study conducted by the New York City Health Department, The Metropolitan Life Insurance Company, and The American Museum of Safety, some fairly complete data have been compiled, resulting from 1,980 physical examinations of food handlers. This number represents only a very small fraction of the food handlers that have been examined in New York City since August, 1915, when a new provision in the Sanitary Code made it compulsory for every food handler to obtain a certificate of health from the Health Department. The cases represented in the study are those for which fairly complete information had been obtained.

Of the 1,980 persons examined, 1,590 were males and 390 were females; 80.2 per cent were in the age period between 20 to 44 years; 81.0 per cent were restaurant and hotel workers; and 16.0 per cent were bakers and confectioners. Of the 81.0 per cent, 44.2 per cent were waiters and waitresses, 19.6 per cent were cooks, and 9.1 per cent were dishwashers and kitchen employees. The examination in these cases was very thorough. It was found that 32.1 per cent of the males and 13.3 per cent of the females were free from any condition or disease worthy of attention. It should be borne in mind that all of these cases were apparently well and that each individual was actually engaged in work at the time of examination. Among the diseases and defects that were found, the following may be mentioned: 10 cases of active tuberculosis, 3 arrested cases and 12 suspected cases; 19 cases of active syphilis and 32 cases of suspected syphilis; 6 cases of gonorrhoea. Determinations for the prevalence of this disease among women could not be made; 370 cases of anemia; 112 cases showing eye diseases; 124 cases of organic diseases of the heart; 64 cases of diseases of the arteries; 237 cases of varicose veins; 110 cases of colds and rhinitis; 25 cases of chronic bronchitis; 104 cases of pulmonary emphysema; 208 cases of pyorrhea alveolaris; 288 cases of dental caries; 202 cases of pharyngitis; 62 cases of hernia, and 133 cases of flatfoot. Bakers and cooks particularly seem to suffer from cardiovascular disease, anemia, flatfoot and respiratory disorders. (*M. P. H.*)

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Supervision of the Feebleminded.—Segregation, much more than sterilization, offers a practical solution to part of our problem at least and may eventually be the final, most practical solution. The best plan for supplementing segregation and sterilization for the present, the only way to obtain the kind of information we need and must have about the feebleminded, the best scheme for educating the people to a comprehension of the problem and a willingness to accept segregation and sterilization when necessary, is the plan for careful scientific supervision of the feebleminded in the community as part of a state or nation-wide program for control and prevention of feeblemindedness.

The school and the ungraded class give us the nucleus for a system of supervision which could be worked in so simply that it would not only not meet with opposition, but would be welcomed by the children and by the parents. In order to make such system of after-care effective in a school system, three things are essential: (1) an adequate mental clinic under the direction of a psychiatrist with psychological training or of a psychologist with psychiatric viewpoint and experience, (2) social service from the time the feebleminded child enters the special class, and (3) a vocational and employment bureau which shall be merely another phase of the mental clinic and the social service. This last essential will help to utilize the labor represented by the feebleminded population.

As to expense, it is merely a question of whether we shall pay blindly or consciously, whether we shall pay in crime, in courts, in reformatories, in prisons, in almshouses, or whether we shall pay in directed care calculated to give us the facts which may in time make control and prevention of feeblemindedness possible.—Taft, Jessie, *Mental Hygiene*, July, 1918, p. 434. (*D. G.*)

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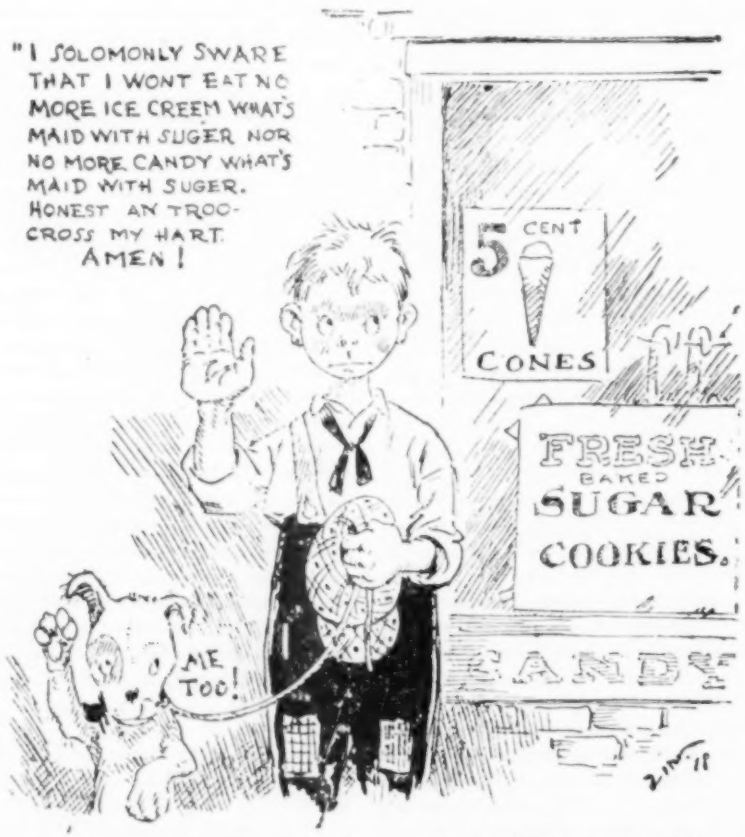
Health Education Conducted by the Office of the Chief Surgeon, A. E. F.—A series of weekly bulletins is being issued by the Office of the Chief Surgeon, American Expeditionary Forces, which is circulated among the medical officers. It is the only educational matter which is being prepared by the Chief Surgeon's Office, and aims to bring to the attention of the medical officers, not only new ideas and suggestions, but to acquaint them with the extent and nature of the prevalence of disease, the best means of combating specific diseases, and the work which is being carried on throughout America's large army which is now in France. Major Haven Emerson, formerly health commissioner of the City of New York, is in charge of the work.

It is stated that the "death-rate in the American Expeditionary Forces from causes other than "in action" is twice as high as that experienced in

civilian life among the same age group in males, and twice that recorded in the Regular United States Army during peace times." This is due apparently to overcrowding, personal uncleanliness and the prevalent habit of promiscuous spitting in and about sleeping quarters and mess. The following diseases seem to be the essential causes of the deaths: pneumonia, diphtheria, meningitis, typhoid fever, scarlet fever, syphilis, tuberculosis, mumps, measles


"I SOLOMONLY SWARE THAT I WONT EAT NO MORE ICE CREEM WHAT'S MAID WITH SUGER NOR NO MORE CANDY WHAT'S MAID WITH SUGER. HONEST AN TROO- CROSS MY HART. AMEN!
5 CENT
CONES
FRESH BAKED SUGAR COOKIES.
CANDY
ME TOO!

AN HEROIC SACRIFICE.

and anthrax. In the case of pneumonia, the incidence has been 4 to 12 times as great as for the United States Army in peace times. The death-rates for this disease have been from 10 to 30 times as high as normally in the army, and from 8 to 25 times as high as in the civilian population of males from 20 to 34 years of age, in the United States.

The epidemic of influenza is discussed, but the Pfeiffer's bacillus is not held as the cause. Warning is sounded against the spread of malaria in France due to the presence of numerous malarial victims from the southern states of the Union. The anopheles mosquito has been found in France too. Another warning against the spread of trachoma to the American troops from the Chinese coolies is also sounded. Attention is also directed against the destruction of lice, the protection of water supplies, the destruction of feces and urine, the treatment of cases of gas poisoning, the treatment and precautions directed against syphilis, and other matters of extreme importance in caring for the health of the American soldier in France.

(*M. P. H.*)

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Army Rejection Statistics.—The author, speaking of pre-war army rejection statistics, says "the rejection statistics of the United States Army are quite difficult of correct interpretation and emphasize the urgency of extreme care in the use of army recruiting data for other than military purposes. The term rejection in army recruiting has

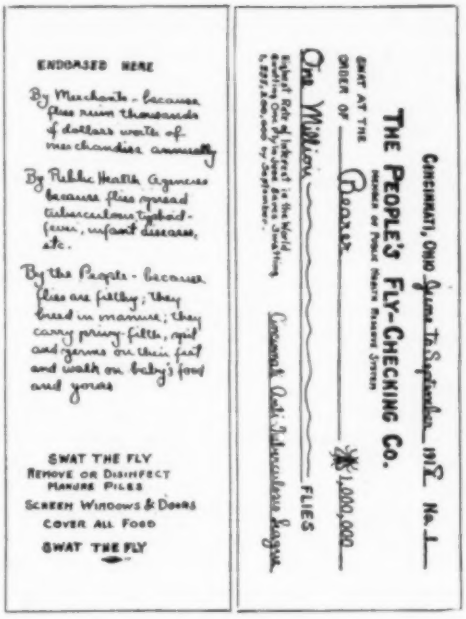
apparently quite a different significance from what it has in life insurance practice or in the physical examination of applicants for official positions."

In the period 1913–1915, out of 461,033 applicants examined for service, 75.9 per cent were declined. "Many applicants were declined in all probability, for defects or deficiencies, physical, mental or moral, each without a very decided bearing upon the question of physical strength and power of endurance."

Conclusions frequently advanced to the effect that the physique of any given country has improved or deteriorated on the basis of recruiting statistics are decidedly misleading and every authority in military statistics rejects unconditionally the assumption that the data can be used for the purpose of ascertaining physical progress or decay.

Under the Selective Service Regulations a total of 730,756 men were rejected from 2,510,706 examined, and with a correction applied for those men who were rejected at Camp, it appears that 35 per cent of the men physically examined by the boards were considered totally unfit for active military service.

The only analysis of the causes of physical rejection which has thus far been made by the Provost-Marshal General's Office concerns 10,258 of the above group of recruits rejected. The author is of the opinion that the rejection statistics of this group fail in every way to sustain the conclusion so frequently advanced by sensational writers that the medical examinations under the first Selective Draft have brought to light a truly astonishing amount of physical impairment and military inefficiency on the part of the men of the draft age period—21 to 30 years inclusive.—Hoffman, F. L., *Army Anthropometry and Medical Rejection Statistics*, Prudential Insurance Co., 1918. (*D. G.*).


ENDORSED HERE
By Merchants - because flies ruin thousands of dollars worth of merchandise annually
By Public Health Agencies because flies spread tuberculosis typhoid-fever, infant diarrhea, etc.
By the People - because flies are filthy; they breed in manure; they carry privy-filth, spit and germs on their feet and walk on baby's food and sores
SWAT THE FLY
REMOVE OR DISINFECT MANURE PILES
SCREEN WINDOWS & DOORS
COVER ALL FOOD
SWAT THE FLY
CINCINNATI, OHIO June to September 1918 No. 1
THE PEOPLE'S FLY-CHECKING CO.
GIVEN AT THE INSTANCE OF PUBLIC HEALTH RELIEF SYSTEM
ORDER OF Boosters
One Million $1,000,000
FLIES
Cincinnati Anti-Tuberculosis League

Fly Checking in Cincinnati.—The Cincinnati Anti-Tuberculosis League has recently got out the clever piece of publicity shown by the accompanying illustration. "On Saturday, June 8," the Secretary of the League writes, "Boy scouts distributed 15,000 copies of the check at the important street corners in the city. Several manufacturing concerns placed checks in their employees' pay envelopes. Altogether it was a very successful campaign, several people returning to ask the Boy Scouts for additional checks. As far as I can determine, not one of them was thrown into the street. Because of their resemblance to real checks many persons used them for playing jokes upon their friends and thus the information about the fly was spread still further."

✠

Sanitation of Rural Workmen's Areas.—This report of the Committee on Welfare Work of the Committee on Labor, Council of National Defense, contains much valuable and practical information and should be of great help to executives in welfare work and others interested in housing. Details as to the selection of new villages and camp sites, the preparation of the site, the provision of a safe water supply, methods for the collection and disposal of excreta, garbage and other refuse, are carefully outlined. In addition plans for the construction of temporary and permanent houses for industrial villages, and the standards of ventilation, drainage and plumbing in connection with these structures are considered.—*Public Health Reports*, September 6, 1918, p. 1477. (*D. G.*)

Vital Statistics in Framingham.—The third of the series of monographs issued by the Framingham Community Health Demonstration has just appeared and deals with the vital statistics of the community. The analysis is very complete; the study covering the ten-year period from 1907 to 1916. The city was divided into precincts, and the statistics were analyzed for each precinct individually, and for the city as a whole. This was done in studying the population, causes of death, death-rates, birth-rates, infant mortality rates, age distribution, and race distribution. The death-rate was calculated not only for the total deaths occurring, but also for the total deaths minus the

non-resident deaths, and also for the corrected number of resident deaths, when the records of residents dying out of town could be obtained. Standardized death-rates were also worked out, using the population of Sweden in 1890 as the basis. Causes of death were investigated and corrected, wherever any doubt of the primary cause existed. A special investigation was also made in the case of deaths reported as due to bronchitis in order to ascertain how many of these deaths were really due to tuberculosis. It was found that about 22 per cent might be added to the registered tuberculosis mortality as a result of this investigation.

The results show that Framingham has been growing rapidly during the past five years, and that the increase is to a large degree among the foreign born, particularly among the age groups under forty. The average yearly death-rate for the period under consideration was 15.30 per 1,000 population. The death-rate for residents only was 12.56 and the rate for the corrected resident deaths was 13.65. The main causes of death are organic heart disease, Bright's disease, cerebral hemorrhage, pneumonia, cancer, and tuberculosis in the order named. Tuberculosis and infant mortality are perhaps the most likely preventable diseases. The tuberculosis death-rate among Italians was low, whereas that among the Irish and Irish-Americans was high. The reporting of the disease is considered very poor. The same is true regarding the reporting of births. It was found that in 1916—the only year for which the birth records are accurate—that the birth-rate among the foreign born was twice that among the native born, whereas the infant mortality rates varied only slightly, in comparison. The birth-rate for the entire city in 1916 was 25.3 and the infant mortality rate for the same year was 84.0. The infant mortality rate was found to be higher in the less prosperous districts.

The authors of Framingham Monograph No. 3 are Dr. Donald B. Armstrong and Franz Schneider, Jr. (*M. P. H.*)

✽

No Specific Cure for Influenza Yet Known.—The United States Public Health Service is besieged with inquiries as to the value in combating or treating "Spanish" influenza. Public interest in this form of treatment appears to have been aroused by newspaper accounts of the trials now being made of vaccines in various parts of the country. So far as the Public Health Service is able to learn, the use of none of these vaccines has gone beyond the experimental stage. In fact those most conversant with the subject hesitate to give any encouragement to the public lest there subsequently come a sad awakening.

"It must be remembered," said Surgeon-General Blue, "that several different vaccines are now being tried. In and around Boston considerable use is being made of Leary's influenza bacillus vaccine; in New York a vaccine made from various strains of influenza bacilli is being tested under the direction of Park, while in Chicago an entirely different type of vaccine, prepared by Rosenow is being tested. This consists of a mixture of pneumococci, streptococci, staphylococci, and influenza bacilli. The reports so far received do not permit any conclusion whatsoever regarding the efficacy of these vaccines or their relative merits. The Public Health Service is watching the experiments carefully, but is not urging any form of vaccine treatment at the present time."

The present epidemic has given rise to the publication of numerous "sure cures" and methods more or less plausible to the lay mind. The advocates of some of these have addressed long communications to Secretary McAdoo, to Surgeon-General Blue, to the War Department or other government agencies; hundreds of them have written to editors of newspapers. In general the suggestions fall into several groups.

First comes the individual who has a specific remedy, the formula of which he is ready to give to the world for a price. One such writer reminds the Surgeon-General of the million dollars that Congress has appropriated for combating influenza, and offers to sell his secret for "a reasonable sum."

Next comes the person with the pseudo-scientific treatment, sometimes "isotonic sea-water," sometimes "ozono therapy," and again "harmonic vibrations." One such writer, well known to the New York health authorities, addressed the Surgeon-General from his present residence, the State Hospital for the Insane.

Still another type is the individual who gives freely of his advice so that humanity may be spared from the pestilence. Such a one writes "sprinkle a little sulphur in each shoe every morning"; this was given to the people of Atlanta by a doctor of forty odd years of practice. He also used it when waiting on yellow fever years ago. A mother advises people to add "ten cents worth of asafetida to half a pint of brandy, and give a teaspoonful every two or three hours. I gave my baby one-fourth teaspoonful with good results."

One writer who says he lives "at the jumping-off place in western California," has perfected a patent medicine which will "knock out germs and remove the real cause of sickness. I got it by combining powerful essencial oils that will penetrate the hardest wood that grows the compound while it is not a poison it will penetrate any and all kinds of germs or

insects and dry or burn it up in a minute." This wonderful xxxxx (name deleted by censor) sells for $1.00 per bottle.

One writer frankly advises the use of a patent medicine formerly widely advertised as a cure for consumption, but now compelled by the government to be labelled simply a remedy for coughs and colds.

A physician writing from Missouri offers "to furnish his remedy for the nominal price of $4.50 for each patient, or will take a Surgeon-Major's commission and pay," and give his services to the Army Medical Department. He has tested his remedy "on the most Desperate caises."

A patriot advises the use of a patent medicine made in Detroit. Used in a case recently, it was observed "that within thirty minutes after applying the medicine the patient was relieved of all pain in the lungs and immediately was well and about."

From Portsmouth, Va., comes a letter which calls attention to the real cause of the epidemic, namely "Descreation of God's Sabbath which He said Keep Holy." Then following a number of quotations from the Bible to support the writer's contention that the epidemic was sent by the Almighty to punish the world for its sinfulness.

Comes also the mental scientist who regards the epidemic as engendered entirely by fear. "This sort of infectious suggestion is a crime against the public, is treason to our government, and the traitors responsible for it shall not be allowed to go unpunished."

Recalling the statement that the epidemic had probably originated in the Orient, one writer advises an examination of all pepper and tobacco throughout the country. She neglects to say what to look for in such examinations.

The food faddist is not missing from those who have sure cures. One advises the elimination of white bread, rice, coffee and tea, and the use of spring water and molasses in place of sugar.

The prescription for alcohol and chloroform to be inhaled from cotton comes from several sources, with slight variations. This is true also of the receipt for hot lemonade without sugar.

The wearing of amulets is also advocated. One writer prefers asafetida tied in a piece of gauze and worn by a string around the neck. Another recommends camphor used in the same way; still another uses a secret compound which he desires to patent. For a receipt consisting of water, salt and coal oil, and called "a sure cure for influenza," a woman writing from Missouri, states that she will be thankful for the reward which she understands has been offered by the government.

The list might be continued, but the suggestions are largely variations and repetitions of what has already been cited.

The United States Public Health Service urges the public to remember that there is as yet no specific cure for influenza, and that many of the alleged "cures" and remedies now being recommended by neighbors, nostrum vendors and others do more harm than good. The chief reliance must be on fresh air, nutritious food, plenty of water, cheerful surroundings and good nursing. If any specific like a vaccine or serum is found to have value, the Public Health Service will give the matter wide publicity.—*U. S. P. H. S. Press Announcement.*

*

Government Bulletins and Posters on Influenza.—Under authority of the million dollar appropriation made by Congress for combating influenza and other communicable diseases, the United States

COLDS, INFLUENZA, PNEUMONIA, AND TUBERCULOSIS ARE SPREAD THIS WAY

Public Health Service has prepared and distributed nearly six million copies of a popular leaflet on "Spanish" influenza, and thousands of posters warning against the dangers of spray infection. Practically all of this material has been distributed through state health officers; some of the posters also through federal channels to post-offices and railroad stations. Because of the more forceful appeal made by pictures, the Public Health Service has issued a striking poster by Berryman, the well-known cartoonist of the Washington *Evening Star*. A supply of these posters has been sent to state health officers throughout the country. A limited number will also be sent to local health offices on request to the United States Public Health Service, Washington, D. C.

Educational material dealing with influenza and other communicable diseases has been supplied to school teachers throughout the country, with the request that they use this in class room instruction.

While the ravages of the present epidemic have been undoubtedly very great, it is not unreasonable to hope and believe that the educational measures which it has called forth will result in an appreciable reduction in the prevalence of respiratory infections generally because of the wider observance of precautions by the public.—Rupert Blue, Surgeon-General, U. S. P. H. S.

✻

United States Public Health Service and Influenza.—With the widespread occurrence of influenza, urgent calls for medical and nursing assistance were directed to the Public Health Service. The regular officers were thereupon assigned to the stricken communities, and the Red Cross, the Volunteer Medical Service Corps and the nursing and medical professions generally were called upon. The V. M. S. C. furnished a list of 1,000 physicians, but the nursing problem was more difficult, and it was necessary to call upon many volunteer untrained nurses.

Congress promptly passed the Weeks bill, appropriating $1,000,000 to fight the epidemic.

For service in communities where the disease is still prevalent, physicians are asked to report to the U. S. P. H. S. Officer in Charge, care of the State Board of Health. Nurses are requested to address the local Red Cross Chapter.

The Public Health Service points to the inadequacy of the present system as indicating the need of a Public Health Reserve.*—*Public Health Reports.*

✻

Gorgas and Ireland Return.—The press announces the return from France of Major-General W. C. Gorgas, M. C., and of Major-General M. W. Ireland, M. C., who succeeds Gorgas as Surgeon-General of the Army. Secretary Baker has announced the recall of Gorgas to active service from which he was automatically retired by age very recently.

✻

Credit to Boston Herald.—The JOURNAL wishes to give due credit to the *Boston Herald*, from which with slight additions, the chart of mortalities was taken, which was shown in our last issue. The original chart was drawn by James O. Jordan, of the Boston Health Department.

*Senate Joint Resolution 63, authorizing the establishment of a Public Health Reserve, has been passed by Congress according to a subsequent statement.

Standard Maternity Records.—The American Association for Study and Prevention of Infant Mortality has issued standard records for use in prenatal and postnatal care. It is desired to give these the widest possible use and health departments are therefore invited to send for specimens to the Association at 1211 Cathedral St., Baltimore, Md.

The prenatal record takes in the preliminary history of the expectant mother, previous pregnancies, history of present pregnancy, medical examination, economic condition of family, history of labor, of puerperium, of child, a summary at end of year, and main directions of prenatal care.

The postnatal record includes the family history, income, housing and sanitation, record of children, baby's history, feeding history, physical examinations, spaces for detailed notes of physician and nurse, and a summary for the year.

✻

Focal Infections of the Mouth.—Focal infection of the mouth (chronic alveolar abscess, chronic pericementitis, acute and chronic infection of tonsils and other oral, nasal and aural cavities adjacent) produce serious, grievous and dangerous diseases of the heart,—endocarditis, myocarditis, pericarditis, pancarditis. Often unrecognized because of its slow, insidious progress, grave maladies of the heart are produced secondary to gross, filthy, offensive, disease of the mouth. The laity must be instructed that the care of the human mouth (and accessory cavities) from focal infection or the early eradication of oral infection when present, is an insurance against the occurrence of many dreadful systemic maladies.—Brown, A. G., *Southern Med. Jour.*, September, 1918, p. 601.

(*D. G.*)

✻

Anti-Tuberculosis Work in Oklahoma.—The Oklahoma Association for the Prevention of Tuberculosis held its first annual meeting on September 24, 1918, in Oklahoma City. The meeting was a public health conference held in coöperation with the State Department of Health of which Dr. John W. Duke is commissioner. Over two hundred people from all over the state attended.

During the past year the Tuberculosis Association has been very active in combating tuberculosis throughout the state. To this end, ten public health nurses were appointed in different communities; two tuberculosis dispensaries were established in Oklahoma City and Muskogee; a school for public health nurses was conducted by the association during the summer; and complete health surveys were conducted in the five largest cities of the state. The surveys were undertaken

not only to aid in combating tuberculosis, but to ascertain exactly what the health conditions in these communities were, and to stimulate each community to better health protection and prevention of disease. In addition an extensive educational campaign was carried on, aided by lantern slides, exhibits, printed materials and a lecture service. The lantern slides and exhibits are original and striking and are said to represent some of the best material along these lines in the country. A campaign is being waged at present for open-air schools and the recognition of incipient cases of disease among children. The association has just published a very attractive pamphlet dealing with the normal diseases of childhood. These are being distributed throughout the state to the teachers in the schools.

For the coming year, the plan is to increase the nursing and dispensary facilities, to care for the discharged tuberculous soldiers, and to obtain legislation for the establishment of state and county sanatoria for the tuberculous.

The secretary of the association is Jules Schevitz. Requests for literature and other information may be addressed to the association at 315 Oklahoma Building, Oklahoma City, Okla. (*M. P. H.*)

✱

North Dakota University Departmental Bulletins.—The North Dakota University has issued 27 brief bulletins, through its public health laboratories, which deal with daily public health problems. Some of the topics considered are: pure water and how to obtain it; the production and care of milk for infant feeding; colds; cerebrospinal meningitis; scarlet fever; disinfection and disinfectants; the teacher and communicable disease; diphtheria; typhoid fever; measles and whooping-cough; fresh air and why; the sanitary privy; rural sanitation. In each case the important principles in connection with the subject are considered. The aim of the bulletins is strictly educational.

(*M. P. H.*)

✱

Women Workers and the Health of the Nation.—From extensive experience in connection with the health of women in industry, Miss A. M. Anderson, the principal lady inspector of factories in England, concludes that although there has been much fatigue and preventable strain, there is apparently no indication at present, that the health of women has suffered because of their increased industrial efforts due to the war. This is probably due to the extra care that has been taken to safeguard their health and to the improved earnings and dietaries of the workers. It is important too that girls who are either too young or physically unable for a job should not be employed. Nor should the mother be permitted to return to her work immediately after childbirth. Work which required serious overstrain was wisely delegated to the men—*The Journal of State Medicine*, September, 1918, London, England. (*M. P. H.*)

✱

STATE HEALTH NOTES.

Maine.—The epidemic of influenza has been prevalent throughout Maine during the last few weeks. The following places report the largest number of cases: Portland, Bath, Eastport, Lubec and Lisbon Falls. The State Department of Health has been instrumental in obtaining the coöperation of the United States Public Health Service in the detailing of United States Public Health Service for organizing the campaigns against influenza in Bath, Lisbon Falls and Eastport. Epidemic influenza was made a reportable disease by the Public Health Council on September 4, 1918, and in addition to this has been placed on the list of diseases requiring modified quarantine.

On September 4, 1918, the Public Health Council of the state of Maine adopted rules and regulations for the control of venereal diseases, which were later approved by the governor and his council. These rules and regulations declare venereal diseases to be dangerous to the public health, and to be reportable and quarantineable under certain conditions, based upon the recommendations of the United States Public Health Service.

An excellent start was made during the past summer in a state-wide inspection of hotels by the State Department of Health, based on rules and regulations previously adopted.

Surveys of Public Health Administration in Portland and Lewiston have been made during the past year by A. P. Pratt, C. P. H., under the direction of the State Department of Health. The former survey was published in the monthly bulletin of the Department for March, 1918. The report of the Lewiston Survey will appear in a coming bulletin.

Governor Milliken has appointed the following coöperating emergency health committee to combat influenza in the state: Chairman, Dr. L. D. Bristol, state commissioner of health; Dr. W. A. Kempf, representing the United States Public Health Service; Mr. L. E. Smith, Jr., representing the Red Cross; and Mr. Harold Sewall, representing the State Public Safety Committee. Through the coöperative efforts of this committee, it is hoped that the epidemic of influenza may be checked more promptly than through the individual efforts of the various agencies concerned.

(*L. D. Bristol, M. D.*)

Massachusetts.—The Massachusetts State Department of Health announces the following appointments: Dr. J. J. Carroll of Holyoke, acting assistant surgeon, United States Public Health Service, to be chief of the subdivision of venereal diseases, State Department of Health of Massachusetts. Lieutenant Carroll succeeds Major Alec Nicol Thomson who is now in charge of the work of correlating the efforts directed against venereal disease in the New England states in behalf both of the Army and of the United States Public Health Service; Dr. Lily Owen Burbank of East Bridgewater to be directer of educational work for women, of the subdivision of venereal diseases.

(*M. E. Champion, M. D.*)

✽

New York State.—The total number of reported influenza cases in New York state from October 2, when the first signs of an epidemic became manifest, to November 1, was 114,486.

Since the epidemic started, the state has had supervision over 122 nurses and 38 physicians engaged in fighting the disease throughout the state. The services of 92 of the nurses and 4 of the physicians were obtained under the special appropriation of $50,000 made available by Governor Whitman for emergency medical and nursing service.

One hundred and three communities in the state have been furnished nursing assistance. Of this number only fifty-five are today considered as under actual epidemic conditions. Thirty-four have been freed to the extent that they are now able to cope with the situation without further state aid.

✽

Public Health Nurses in New York State.—According to the records of Miss Ysabella Waters, of the National Association of Public Health Nurses, there were on September 1 a total of 1,805 public health nurses in New York State. Of these 1,084 are located in New York City, 121 in Brooklyn, which leaves a total of only 600 nurses engaged in the various branches of public health work in the rest of the state. Later statistics compiled by the New York State Department of Health places the number of up-state nurses as approximately 700.

✽

Major Berry Made Lieutenant-Colonel.—Information has recently been received that Major Berry, formerly sanitary supervisor, and later epidemiologist in the New York State Department of Health has recently been promoted to Lieutenant-Colonel.

At the battle of Wytschaete Ridge Major Berry outlined a special plan of campaign which received the approval of the Major-General and which resulted in his command achieving its particular objectives in quicker time than any other unit, and with fewer casualties. The regiment and Major Berry won the commendation of the entire division.

(*Albany Journal*, October 16.)

✽

Staff of Bureau of Venereal Diseases.—Permanent appointments to the staff of the Bureau of Venereal Diseases of the New York State Department of Health have recently been made, as follows: Joseph S. Lawrence, M. D., chief; Edward H. Marsh, M. D., consultant; Walter S. Goodale, M. D., hospital and dispensary inspector and organizer; F. S. Honsinger, M. D., lecturer on social diseases; Maud Casey, supervising nurse and social worker.

✽

Death of Miss Cunningham, Supervising Nurse.—Miss Hannah M. Cunningham, one of the supervising nurses of the New York State Department of Health, died at Ithaca, October 23, of bronchopneumonia following influenza.

Miss Cunningham was formerly school nurse in the Troy public schools. She became connected with the New York State Department of Health in April, 1918, and did effective work as nurse in the after-care of poliomyelitis. Later she was assigned to assist newly appointed municipal public health nurses. When the influenza epidemic started, Miss Cunningham was detailed to the Emergency Hospital at the Camp of the Students' Training Corps at Cornell University.

Miss Cunningham was a graduate of the public health nurses' training schools of New York, Boston and Syracuse and was regarded as one of the best qualified nurses in the department.

(*B. R. Rickards.*)

✽

New York City.—The epidemic of influenza continues with unabated severity, though for the past week the cases have shown a less number. The deaths have been more frequent. Sanitary Code, Article 12, was revised, relative to the heating of occupied premises, requiring landlords to furnish tenants who have contractural relations regarding heat, maintaining a minimum temperature of 68°.

Hospital clearing bureau, for the purpose of handling cases concerning admission of patients, distribution of patients, securing physicians and aiding in obtaining nurses and nurses aids.

Established clinics for advice to those who could not secure medical attention and for the administration of immunizing vaccine, produced by the research laboratory of this department.

Exhibits prepared relative to the use of masks, also instruction relative to the making of masks.

A crêpe paper mask, 13 x 4 inches with a hole at each end 1 inch x 2 inches, making loops for the ears, being specially advised on account of its efficiency and inexpensiveness.

A motion-picture film was prepared for the news weekly, exhibiting the preparation and use of mask, advising the public to protect themselves in this manner. (*S. Dana Hubbard, M. D.*)

✱

Ohio.—Dr. R. P. Albaugh, director of the division of industrial hygiene of the State Department of Health, has been granted a leave of absence to take up work with the United States Public Health Service as director of an industrial hygiene field unit. The state industrial hygiene work is in temporary charge of Dr. E. R. Hayhurst, former director of the division and more recently consultant to the division.

Miss Sara A. Kerr, statistician in the State Department of Health, has sailed for France for duty with the American Red Cross. She is on leave of absence from her state position.

Dr. E. W. Scott, of the United States Public Health Service, was assigned to duty in the State Department of Health during the influenza epidemic as director of the field work of the Service in the state. He was in charge of a force of fifty physicians employed by the Service for work in the most serious local outbreaks. The Red Cross Lake Division established an emergency relief bureau in the department, under Stockton Raymond, to handle calls for nurses and supplies.

With the appearance of the influenza epidemic in Ohio, the State Department of Health adopted a set of instructions to local health officials, directing them to close theaters, schools, churches and other places of public assemblage when influenza appeared in their respective communities. They were also instructed to forbid loitering or congregating in saloons, poolrooms and other places. Influenza was made a reportable disease by these regulations.

As the epidemic spread rapidly over the state, "closing orders" were soon put into effect by local health authorities in practically all parts of Ohio. These various local regulations differed greatly in detail, but in general the principle followed was to stop all unnecessary gatherings, especially indoor public meetings.

Influenza first appeared in Ohio at Camp Sherman, the army cantonment at Chillicothe. This outbreak was followed by several in widely scattered communities, all of which were traced, more or less definitely, to Camp Sherman, Great Lakes Naval Station and Fort Sheridan. After these beginning outbreaks, the spread of the disease to other localities was rapid. Especially severe attacks were experienced in several mining districts where living conditions facilitated the rapid spread of the disease and increased the fatality rate.

The State Department of Health distributed 325,000 educational circulars, giving instructions for the prevention of influenza and the care of sufferers.

The danger in depending upon disinfection to make an impure water supply safe for public use was illustrated recently by a typhoid outbreak of forty-four cases at Xenia, Ohio. Epidemiological investigation and analysis of city water samples proved the water to be the source of infection. After further study it was found that the bleaching powder used in disinfection was of only one-fifth its guaranteed strength. The superintendent of the disinfection plant, who was not a chemist, had failed to detect this weakness and had been using the powder in the same quantities as required for full-strength chemicals. The State Department of Health recommended abandonment of the unsafe source of supply at as early a date as possible and the substitution, in the mean time, of disinfection by liquid chlorine for the bleaching-powder treatment. (*Vinton E. McVicker.*)

✱

Wisconsin Public Health Notes.—Dr. B. L. Schuster, diagnostician at the State Board of Health laboratory at Albany, N. Y., and formerly connected with the United States Public Health Service, has been appointed full-time health officer and director of the state coöperative laboratory at Wausau, Wis.

Dr. W. W. Stebbins has been appointed medical supervisor of the Madison public schools.

Dr. W. S. Lincoln, a former health officer of Dodgeville, Wis., died from influenza in October.

Miss Elizabeth Casey, formerly superintendent of the Trinity Hospital Nurses' Training School, Milwaukee, has assumed charge of the training school at Mercy Hospital, Oshkosh.

The new rules of the Wisconsin State Board of Health for the prevention and control of venereal diseases have been officially promulgated and have the force of law.

Dr. W. D. Stovall, director of the Wisconsin State Laboratory of Hygiene, has been assigned by Surgeon-General Rupert Blue to direct the work of venereal disease control for the state of Wisconsin.

Dr. I. F. Thompson, Eau Claire, Wis., deputy state health officer for the western and northwestern Wisconsin territory, has resigned to join the service, and has gone to Fort Oglethorpe, Georgia. Dr. Thompson has received a captain's commission and been assigned to the epidemiological division of the medical service.

Influenza was widely prevalent throughout Wisconsin in October, and the entire medical and nursing resources of the state were taxed to the utmost to combat it. An order by the State Board of Health on October 10 instructed local health authorities to close all schools, churches, Sunday schools, theatres, moving picture houses, other places of amusement, and all public meetings. This was supplemented on October 25 by an order to continue unrelaxed the restrictions upon all public assemblages. The southern section of the state was first affected and the disease raged for several weeks before signs of diminution appeared, and then spread into the northern counties. In some places every physician was down with the disease and a large part of the population were ill. The State Board of Health assisted in supplying such towns with medical aid wherever possible. The closing order was placed in effect in all communities, and the utmost coöperation was given by municipal authorities and the public in making the order's enforcement fully effective. In a number of cities teachers whose work was suspended by the closing order responded to calls for emergency nursing, and gave devoted and intelligent service for weeks in caring for influenza-pneumonia cases under the directions of the physicians. Their spirit in this emergency was one of the splendid by-products of the fearful scourge which ran its course in so many communities.

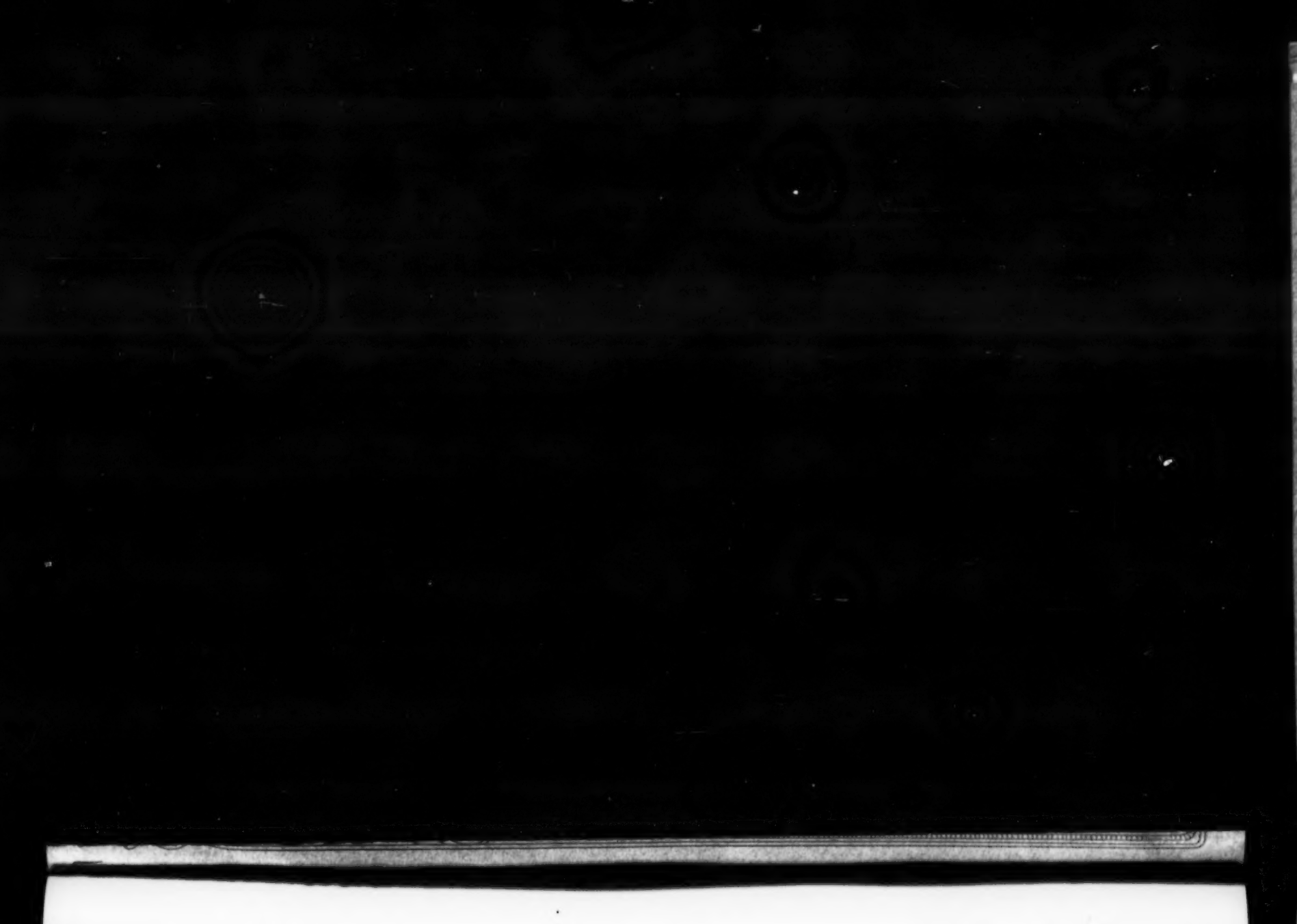
PUBLIC HEALTH LABORATORY NOTES

Abstracted by ARTHUR LEDERER, M. D.

Adsorptive Disinfection by Metallic Combination.—Finely divided wood charcoal, Fuller's earth, silicic acid, animal charcoal, iron oxide, alumina, calcium oxalate and barium sulfate all act as disinfectants toward staphylococcus due to their adsorptive properties. The bacteria are retained living on the surface of the adsorption medium. The amount of adsorption varies from 99.97 per cent with wood charcoal to 66.32 per cent with alumina. The deposition of thin films of metals on the adsorption medium has the effect of killing the adsorbed bacteria, the action of the metal being specific. A mixture of two metals is still more effective in certain cases. On injecting colloidal metals into mice, mixtures of metals were found to be more deadly than the single metals.—H. Bechhold, *Z. Elektrochem.*, 24, 147 (1918); *Jour. Soc. Chem. Ind.*, 37, 528a (1918).

Ammonia Determination in Urine, Serum Etc.—Ten cc. of the sample is mixed with 40 cc. of water and distilled at 50 C. under 5 to 10 mm. pressure with addition of 10 cc. of 10 per cent sodium carbonate solution; the distillate is collected in a definite quantity of standardized sulfuric acid. The distillation of the ammonia is complete in about 45 minutes. Urea does not yield any ammonia under these conditions.—H. Wiessmann, *Landw. Versuchs Stat.*, 91,347 (1918); *Jour Soc. Chem. Ind.* 37,532a (1918).

Official Control of Antipneumococcus and Antimeningococcus Serums.—A summary of the results of tests for potency. Work now in progress is expected to result in the adoption of test serums which manufacturers may use for comparative testing. It seems unlikely that the same exactness that obtains in testing diphtheria antitoxin or tetanus antitoxin will be accomplished with antipneumococcic or antimeningococcic serum, but the user may be assured that either of these preparations on leaving the manufacturing establishment is of as high degree of potency as it is practicable to attain.—G. M. McCoy and J. P. Leake, *Public Health Reports*, August, 1918.

The Prevailing Pandemic of Influenza.—The disease is characteristic of the ordinary endemic influenza, but it is more severe and much more contagious. It is caused by a specific virulent strain of the influenza bacillus, against which individuals of the younger generation have relatively no immunity. In from 5 to 10 per cent of the persons afflicted, it develops into a massive and very fatal broncho pneumonia. This pneumonia is primarily caused by the influenza bacillus, this micro-organism being recovered from 82.6 per cent of the lungs at necropsy, in 31.6 per cent of which it is found in pure culture. The pneumonia is frequently complicated by pneumococcus or streptococcus infection. The disease is not due to a filtrable virus. This has recently been determined in an experiment performed in conjunction with Prof. Milton J. Rosenau of Harvard Medical School.—J. J. Keegan, *Jour. Am. Med. Assoc.*, 71,1051 (1918).

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